

FLIGHT

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DIARY OF CURRENT AND FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list:—

- 1932
- Feb. 13. Rugby: R.N. v. R.A.F., at Twickenham.
Feb. 13. Reading Ae.C. Dance.
Feb. 20. Rugby: R.A.F. v. Coventry, at Coventry.
Feb. 22. British Gliding Association, Annual General Meeting.
Feb. 24. "A Flight to Abyssinia," Lecture by Sqdn.-Ldr. J. L. Vachell, before R.U.S.I.
Feb. 24. Rugby: R.A.F. v. United Bank, at Ealing.
Feb. 25. "Catapults," Lecture by P. Salmon before R.Ae.S.
Feb. 25. Football: R.A.F. v. Kent at Margate.
Feb. 29. "Flying Boats on Commercial Air Routes," Lecture by C. H. Jackson, at City and Guilds Eng. College, S. Kensington.
Mar. 1. "Some Problems connected with High-Speed Compression-Ignition Engine Development," Lecture by C. B. Dicksee before R.Ae.S.
Mar. 2. "Motorless Flying," Lecture by E. C. Gordon England, before Roy. Soc. Arts.
Mar. 4. Leicestershire Ae.C. Annual Ball.
Mar. 5. Lloyd's Register Cricket Club Annual Reunion and Dinner, May Fair Hotel.
Mar. 5. Rugby: Army v. R.N., at Twickenham.
Mar. 9. Rugby: R.A.F. v. Oxford University, at Oxford.
Mar. 10. "Results with the New Wind Tunnel at N.P.L.," Lecture by E. F. Relf, before R.Ae.S.
Mar. 16. "Development of Naval Air Work," Lecture by Commodore N. F. Laurence, before R.U.S.I.
Mar. 23. "High-Speed Flying," Lecture by Sqdn.-Ldr. A. H. Orlebar, before R.U.S.I.
Mar. 24-28. London Gliding Club's Meeting at Dunstable.
Apr. 1. Entries close at ordinary fees for King's Cup Race.
Apr. 2. Rugby: Army v. R.A.F., at Twickenham.
Apr. 2-10. National Aircraft Show, Detroit, U.S.A.
Apr. 7. "Wing Construction," Lecture by H. J. Stieger, before R.Ae.S.
Apr. 13. "The North-West Frontier of India," Lecture by Maj.-Gen. S. F. Muspratt, before R.U.S.I.
Apr. 14. "Aero Engine Accessories," Lecture by W. L. Taylor, before R.Ae.S.
Apr. 21. "Air Port Development," Lecture by N. Norman, before R.Ae.S.
May 1. Entries close at double fees for King's Cup Race.
May 15. Skegness Air Pageant.
May 18. Household Brigade Flying Club Meeting, Heston.
May 22-30. Conference of Transoceanic Aviators at Rome.
May 28. London-Newcastle Air Race for "Newcastle Evening World" Trophy.
May 28. Brooklands Meeting.

INDEX FOR VOL. XXIII

The 8-page Index for Vol. XXIII of "Flight" and "The Aircraft Engineer" (over 6,500 references) (January to December, 1931), is now ready and can be obtained from the Publishers, 36, Great Queen Street, Kingsway, W.C.2, price 1s. per copy, net (1s. 1d. post free).

EDITORIAL COMMENT



DISARMAMENT is the question of the moment. Three schemes are before the Disarmament Conference at the moment of writing: the Draft Convention drawn up after five years of work by the Preparatory Commission, the proposals of France, and the proposals of Great Britain. On another page we publish the chapter from the Draft Convention which deals with air armaments and the chapter of the accompanying report which comments on it, as well as resumés of the French and British proposals. We propose to add some reflections of our own.

In the Draft Convention it is proposed to limit the numbers and total horse-power (according to an agreed formula on which we have already made some comments) of aeroplanes and airships in the air arms and auxiliary air arms of each contracting Power. The French proposal is to limit bombers only according to a formula based on size and power of the machines, and without regard to numbers. The British proposals, so far as they are set forth in Sir John Simon's speech, do not propose any limitation in numbers or size of aircraft (though the Draft Convention is accepted as a basis of discussion), but only in the type of bombs which the aircraft may use.

The French proposals have been criticised in Geneva as not suggesting any disarmament at all. They include a proposal to arm the League of Nations with a force of heavy bombers with which it could enforce its will on any recalcitrant State. In theory, this seems most desirable, but in practice there must be many difficulties in the way of carrying out such a proposal. On the whole, the French proposals do not seem to have been taken very seriously at Geneva, and are regarded more

as an electioneering move than as a contribution to the cause of world disarmament. The utterances of a nation which is on the eve of a general election must always be scrutinised with much care, for the Government which makes them is like a sick man, preoccupied with his own chances of recovery.

Before considering the British proposals, let us turn to Article 28 of the Draft Convention. This contains four paragraphs which deserve careful study. The first lays down that Parties shall "refrain from prescribing" the embodiment of military features in civil aircraft material; the second that the Parties shall "not require" civil aviation enterprises to employ personnel specially trained for military purposes; the third that they shall not subsidise, directly or indirectly, air lines "principally" established for military purposes; and the fourth that they shall encourage the conclusion of economic agreements between civil aviation undertakings in different countries.

So far as the letter of these articles goes, it would be easy for any Power to drive a coach-and-four through all of them. If the spirit of them were observed loyally up to its logical conclusion, it would impose some very hampering restrictions on British habits and ambitions. For instance, according to the spirit of paragraph 2, we ought rather to discourage test pilots and air line pilots from joining the Reserve of Air Force Officers, and the Air Ministry Appointments Board ought not to try to find posts in flying concerns for Short Service officers who have completed their term. All this would be very unreasonable. Canada, who uses her Air Force chiefly for forest patrol and similar civil services, has already reserved her agreement to this paragraph. Then, as regards subsidising air lines, after next April Imperial Airways may not be allowed to use the aerodromes in Persia. This, it seems, would drive them to use a flying-boat service down the Arabian side of the Persian Gulf, and it would be very much to the advantage of the Royal Air Force that such a route should be developed. It is a necessity of the British Empire that our R.A.F. flying-boats should be able to reinforce British stations in a different country as speedily as possible. It is only common sense that where possible the civil and military route should coincide, and in the Persian Gulf we may soon have a concrete case. This article of the Draft Convention endeavours to hamper such a common-sense proceeding so far as it can. If the Arabian coast route has to be developed, it will be subsidised by the Government, and it will certainly be used by the Royal Air Force. Will the League of Nations consider that it has been *principally* established for military or for civil purposes? And what about the Africa airway, which was first established by the Royal Air Force?

Sir John Simon pointed out that limitation of armaments could only be effected by two methods, first the fixing of limits, and the second by excluding certain means of warfare, and he said that Great Britain advocated both methods. For the purpose of limiting numbers he was not in favour of a percentage reduction. In this connection we may refer to our leading article in our issue of January 29, when we commented on the theories put forward by *Die Luftwacht* that France and some other nations had overstated their strength in aircraft in order to discount any percentage reduction. We have made

some enquiries, and we are satisfied that the returns made by France may be accepted as accurate. But Japan avowedly included in her return aircraft which will come into being when she completes her present programme, but which now exist only in anticipation. Sir John alluded in veiled language to this type of return, and advocated limitation by the Datum Line process rather than by a percentage reduction, which, "applied to an assumed figure in the future, will only tend to make that assumed figure bigger than it ought to be."

In excluding certain methods of warfare, it may be noted that Sir John, beyond the expression "these new methods of warfare—the use of gas and submarine and of bombing from the air," made no definite allusion to aircraft. He proposed to abolish the use of gas and chemical warfare, which can be operated from the air as well as from the ground, but said nothing about any other restriction of aircraft. He merely left the Draft Convention as a basis of discussion.

Our own feeling is that Sir John Simon was very well advised to go no further than he did in this matter. If aircraft are to be used for attacks on civil populations, they will earn the epithet of "Hell's Angels." So long as their activities are confined to the destruction of military objectives, they are quite legitimate weapons of war. The validity of this position is not affected by the fact that a bomb may miss a factory and kill some civilians. Such accidents may happen when any missile weapon is discharged. There is, however, a world of difference between such an accident and a deliberate onslaught on residential areas with gas bombs. The crucial point is the type of bomb to be used, and the British proposal would rule out attacks on a civilian population.

Sir John made the point that the object of the Conference should be to strengthen defence at the expense of attack, and it is very significant that he did not include bomber aeroplanes among the formidable weapons of attack. Others, who are not such clear thinkers as Sir John, have made the error or regarding bombers as most aggressive weapons. There is nothing more aggressive than a munitions factory, and to destroy such factories is a most effectual means of weakening attack. If factories are situated out of the reach of the artillery, and Sir John proposes that the calibre of the guns is to be limited, the only weapon which can destroy the factories is the bomber. To forbid the use of legitimately armed bombers would not, in actual fact, tend to reduce the horrors of war.

The argument has often been put forward that it is useless to forbid the manufacture of a certain weapon in peace time because it can easily be made after war has been declared. There is truth in that; but it must be remembered that if no submarines, for example, are made and used in peace time, there can be no progress in the technique of design and use of submarines. Moreover, experience has shown that if the rules of international law are framed on reasonable lines and do not attempt to forbid what are obviously legitimate military operations (e.g., shelling or bombing an ammunition dump) these rules will usually be observed by belligerents. When reasonable operations are forbidden, the rules will certainly be disregarded by both sides, and all international law will in consequence lose some of its prestige. One great merit of Sir John Simon's proposals is that they do not attempt to forbid too much.

FRENCH COMMISSION VISITS ENGLAND



AFTER visiting the Rolls-Royce works at Derby, the French Commission, which included M. Caquot, Director General of the French Technical Services; Col. Tetu, of the French Air Force; and M. Martinot-Lagarde, the engine expert of the French Air Ministry, last week saw some splendid demonstrations of British aircraft at the Fairey and Hawker aerodromes. Mr. Staniland demonstrated the "Kestrel"-engined Fairey "Fox," and Mr. Bulman and Mr. Sayer the Hawker "Hart" and "Fury" respectively. The upper photograph shows a line-up at Brook-

lands of Hawker "Furies" and (behind) "Harts." On the left, Mr. Sopwith chatting with his visitors. On the right, a group at the Fairey aerodrome, including, from left to right, Fl. Lt. Hilton (Fairey Co.), M. Martinot-Lagarde, Gp. Capt. R. J. Bone, Air Attaché in Paris, Col. Tetu, M. Caquot, Mr. Macpherson (Fairey Co.), Lt. de Sala (French Air Attaché in London), and Sqd. Ldr. Maurice Wright (Fairey Co.). In the lower photograph Mr. Macpherson is seen explaining the features of the Fairey "Fox" to Col. Tetu and M. Caquot (FLIGHT photos).

The Disarmament Conference

IN the consideration of the Disarmament Conference the question of air armaments looms large. The peoples of the world are more terrified of bombardment from the air than they are of any other form of attack. The drastic proposals made by France have attracted much attention. In order that our readers should be in a position to understand the situation, we publish below the chapter from the Draft Convention which was drawn up by the Preparatory Commission for the Disarmament Conference and submitted to the Conference as a basis of discussion, and following that the chapter from the accompanying Report also submitted to the Conference by the Preparatory Commission.

Extract from the Draft Convention

CHAPTER C.—AIR ARMAMENTS

Article 25¹ 2

The number and total horse-power of the aeroplanes, capable of use in war, in commission and in immediate reserve in the land, sea and air armed forces of each of the High Contracting Parties shall not exceed the figures laid down for such Party in the corresponding columns of Table I annexed to this Chapter.

The number and total horse-power of the aeroplanes, capable of use in war, in commission and in immediate reserve in the land, sea and air formations organised on a military basis of each of the High Contracting Parties shall not exceed the figures laid down for such Party in the corresponding columns of Table II annexed to this Chapter.

Article 26¹ 2

The number, total horse-power and total volume of dirigibles, capable of use in war, in commission in the land, sea and air armed forces of each of the High Contracting Parties shall not exceed the figures laid down for such Party in the corresponding columns of Table III annexed to this Chapter.

The number, total horse-power and total volume of dirigibles capable of use in war, in commission in the land, sea and air formations organised on a military basis of each of the High Contracting Parties shall not exceed the figures laid down for such Party in the corresponding columns of Table IV annexed to this Chapter.

Article 27

Horse-power shall be measured according to the following rules

The volume of dirigibles shall be expressed in cubic metres.

Article 28

1. The High Contracting Parties shall refrain from prescribing the embodiment of military features in the construction of civil aviation material, so that this material may be constructed for purely civil purposes, more particularly with a view to providing the greatest possible measure of security and the most economic return. No preparations shall be made in civil aircraft in time of peace for the installation of warlike armaments for the purpose of converting such aircraft into military aircraft.

2. The High Contracting Parties undertake not to require civil aviation enterprises to employ personnel specially trained for military purposes. They undertake to authorise only as a provisional and temporary measure the seconding of personnel to, and the employment of military aviation material in, civil aviation undertakings. Any such personnel or military material which may thus be employed in civil aviation of whatever nature shall be included in the limitation applicable to the High Contracting Party concerned in virtue of Part I, or Articles 25 and 26, of the present Convention, as the case may be.*

3. The High Contracting Parties undertake not to subsidise, directly or indirectly, air lines principally established for military purposes instead of being established for economic, administrative or social purposes.

4. The High Contracting Parties undertake to encourage as far as possible the conclusion of economic agreements

between civil aviation undertakings in the different countries and to confer together to this end.

Extract from the Report by the Preparatory Commission for the Disarmament Conference

CHAPTER C.—AIR ARMAMENTS

145. The text adopted in the first part of the sixth session provided in a single article for the limitation of air material in service by means of two tables, one for armed forces and the other for formations organised on a military basis, the limitation being applicable to aeroplanes and dirigibles capable of use in war employed in commission in the land, sea and air forces, or in the formations organised on a military basis. All these provisions have been regrouped by the Drafting Committee. They are the subject of Articles 25 and 26, which the Commission has adopted.

Articles 25 and 26

146. The method of limitation fixed in these articles represents a compromise formula taking account of the principal standards of limitation proposed to the Commission. The standard of limitation in the case of aeroplanes is first the number, and secondly the total horse-power. In the case of dirigibles it is the number, total horse-power and total volume.

147. The Commission accepted at the second reading, by 9 votes to 8 with some abstentions, a British proposal to limit, not only machines in service, but also complete machines in immediate reserve belonging to the State.

148. The German delegation made a reservation in regard to these articles, on the ground that reduction and limitation do not apply to the aggregate of war material, including material in reserve, and that in its view the countries are left free to increase their stocks of aircraft not yet put together, and to arrange their air armaments as they please, without exceeding the limits fixed by the Convention.

149. The Turkish delegation reserved its opinion on the extension of the direct limitation provided for in Articles 25 and 26 to armaments in reserve.

150. The tables referred to in these two articles will contain the figures allocated to each contracting party. As regards the aeroplanes of the armed forces (Table I) and those of the formations organised on a military basis (Table II) and dirigibles (Table III—Dirigibles of the armed forces, and Table IV—Dirigibles of the formations organised on a military basis), there are certain differences in the make-up of the tables. The two tables relating to the armed forces (Tables I and III) contain an obligatory column for the total of the aeroplanes and dirigibles respectively, and three optional columns for the aeroplanes or dirigibles stationed in the home country, overseas or in aircraft-carriers. In the case of aeroplanes, the figures will show first the number and secondly the total horse-power. In the case of dirigibles, there will be additional figures showing the total volume. The tables with regard to the formations organised on a military basis (Table II—Aeroplanes, and Table IV—Dirigibles) have the same columns and the same particulars as the others, without column (d) (Tables I and III), which is irrelevant in the case of formations organised on a military basis.

Article 27

151. It should be noted in the case of this article that the British and Canadian delegations consider that it is impracticable to find any standard of horse-power measurement that would afford a satisfactory basis of limitation.

152. The French delegation had proposed at the first reading to measure horse-power according to the rules laid down by the International Air Navigation Commission. These rules are as follows:—

"The power of an engine is the average power that the engine generates during two trials of one hour each during which it runs without stopping at a pressure of 760 millimetres of mercury in dry air and at a temperature of 15 deg. C. The engine power will be measured in horse-power of 75 kilogramme-metres a second and will be expressed to the nearest lower horse-power for engines not exceeding 50 horse-power within 5 horse-power for engines between 50 and 200 horse-power and within 10 horse-power for engines exceeding 200 horse-power."

¹ See reservation by the German Delegation, paragraph No. 148 of the Report.

² See reservation by the Turkish Delegation, paragraph No. 149 of the Report.

³ See reservation by the Canadian Delegation, paragraph No. 163 of the Report.

153. The delegation of the United States expressed the view that, in the case of a subject on which technical methods change with great rapidity, it was not desirable to adopt a method at the present time which might not be acceptable by the time the Conference meets.

154. The Commission accepted this standpoint, and decided not to propose particular rules. The Commission is, however, of opinion that it is desirable for the Council to entrust to experts the preparatory studies required for the laying down of such rules, and that such rules should be communicated to the Governments, which might be invited to accept them as a preliminary basis for calculating the figures to be inserted in the table.

155. The German delegation makes a reservation of a general character in regard to Tables Ic, IIc, IIIc, IVc, attached to Chapter C of Part II. This reservation is to the following effect: for the purposes of reduction of armaments, the material which a contracting party may assign to its overseas territories may be of varying importance in relation to another contracting party by reason of the geographical situation of its territories in relation to the home country territories of the two contracting parties. One contracting party will therefore have every reason to regard the overseas material of another contracting party as forming part of the home country material of the latter, when such an assumption is justified by the proximity of the overseas territories in relation to the home territories of the two parties.¹

156. The Turkish delegation repeated in regard to the tables attached to Chapter C the reservation it had made before in regard to the tables in Part I (Chapter A).

Article 28.

157. Article 28 deals with the interesting problem of the relation between civil and military aviation.² It makes provision for prohibitions and obligations to be imposed on the contracting parties, with a view to avoiding the danger involved in prescribing the embodiment of military features in the construction of civil aeroplanes, and with a view to encouraging the independent development of purely civil aviation. It is not superfluous to reproduce the somewhat complicated text of Article 28:

"1. The High Contracting Parties shall refrain from prescribing the embodiment of military features in the construction of civil aviation material, so that this material may be constructed for purely civil purposes, more particularly with a view to providing the greatest possible measure of security and the most economic return. No preparations shall be made in civil aircraft in time of peace for the installation of warlike armaments for the purpose of converting such aircraft into military aircraft.

"2. The High Contracting Parties undertake not to require civil aviation enterprises to employ personnel specially trained for military purposes. They undertake to authorise only as a provisional and temporary measure the seconding of personnel to, and the employment of military aviation material in, civil aviation undertakings. Any such personnel or military material which may thus be employed in civil aviation of whatever nature shall be included in the limitation applicable to the High Contracting Party concerned in virtue of Part I, or Articles 25 and 26 of the present Convention, as the case may be.

"3. The High Contracting Parties undertake not to subsidise, directly or indirectly, air lines principally established for military purposes instead of being established for economic, administrative or social purposes.

"4. The High Contracting Parties undertake to encourage as far as possible the conclusion of economic agreements between civil aviation undertakings in the different countries and to confer together to this end."

¹ The Italian delegation called attention to the reservation presented by it with reference to the tables annexed to Part I, Chapter A.

² The Commission, in the course of its proceedings, examined on several occasions the problem of the relations between civil and military aviation. The draft Convention submitted on first reading contained the following article:

"The limitations laid down are accepted by each High Contracting Party in the light of the present development of civil aviation in other countries."

On the second reading, the Commission was of opinion that as this article simply noted a *de facto* situation it was not necessary to retain it in the draft Convention, and decided that it would be sufficient to mention in the report that various delegations reserved the right to bring the whole question of civil aviation before the Conference.

158. This article was drafted after the work of the Special Committee of Experts on Civil Aviation. The Preparatory Commission agreed with the Committee of Experts that the Convention should avoid any provision capable of obstructing the development of civil aviation; but it was of opinion that all efforts should be directed towards differentiating more and more definitely between civil and military aviation, and that Governments should be prevented from interfering in civil aviation undertakings in order to divert them from purely civil objects.

159. The Soviet delegation submitted the following amendment in the course of the discussion:

"Any adaptation of civil aviation material to the establishment of armaments or to military uses is prohibited."

Under the terms of this amendment, the Government would be bound to take steps to prevent the construction for military purposes, or the adaptation to military purposes, of aircraft, whether constructed by, or belonging to, private companies or private persons.

160. It should be noted that the text of the article approved by the Commission does not bind the Governments to impose restrictions on the private manufacture or adaptation of civil aircraft to purposes of war, but only prohibits them from encouraging such adaptation.

161. An amendment was submitted to the Commission by the Canadian delegation to delete paragraph 2 of Article 28 and to substitute the following:

"Personnel seconded to, and military material employed in, civil aviation, whether Government or commercial, shall be counted in the agreed quota."

The effects of this amendment would have been to set out clearly that all seconded personnel and machines would be counted in the quota allotted to each State, and also to eliminate the temporary and provisional character of seconding.

162. The Commission, while appreciating the special circumstances of Canada, was not prepared to recede from the general rule to which it had given its approval, namely, that seconding should be only of a provisional and temporary character. It was thought that a solution of the difficulty might be found in the establishment of an exceptional arrangement, the form of which would have to be settled by the Conference. The Commission, while disallowing the deletion of the second sentence of paragraph 2 of Article 28, accepted unanimously the insertion of the Canadian amendment by which all seconded personnel and material should be included in the quota allotted to each State.

163. The Canadian delegation subsequently submitted a reservation in regard to the "temporary and provisional" character of the seconding of personnel to, and the employment of military aviation material in, civil aviation undertakings. Canada, because of its special needs and problems, requires, for the reasons given in the Minutes of December 2, 1930, the unrestricted right of seconding, in order to develop its country of vast distances and to protect its citizens and natural resources.

164. In the course of the discussion on paragraph 3 the British delegation stated that it must be clearly understood that the proposal did not imply that the Governments committed themselves to complete internationalisation of aviation, and that on this point the British Government reserved its entire freedom of action.

165. The British delegation proposed the insertion of a new article worded as follows:

"Each of the High Contracting Parties agrees to limit its annual expenditure on the maintenance, purchase and manufacture of war material, for air armaments, to the figures and under the conditions defined in the Annex to the present Convention."

The voting on this article was as follows: 5 for; 6 against; 13 abstentions.

166. The British delegation expressed particular regret at the failure of the Commission to adopt a system of budgetary limitation of air material. They felt that the science of aeronautics is still in so early a stage that very great developments in size, cost and destructiveness of military machines are to be apprehended. These developments will in no way be affected by the limitation of the total number of machines, and they fear it is impossible to rely on the limitation of horse-power as a practically effective check. Without budgetary limitation, therefore, they believe that the air arm, potentially the most

destructive to civilisation, will be the most free for competitive international development.

167. During the first part of the sixth session the German delegation submitted a proposal to prohibit the launching of weapons of offence of any kind from the air, as also the employment of unpowered aircraft controlled by wireless or otherwise, carrying explosive or incendiary gaseous substances.

168. After a very interesting discussion, this proposal was rejected, five delegations voting in its favour. In the discussion, the German delegate explained that he regarded these methods as essentially offensive, their destructive effects threatening the civilian population. The delegations which did not accept the German proposal stated that they did not thereby imply the authorisation of bombardment from the air of civil populations.

THE PROPOSALS OF FRANCE

On Friday, February 5, M. Tardieu, on behalf of France, laid definite proposals before the Disarmament Conference. The following summary of these proposals was given by the special correspondent of *The Times*:—

The plan suggests, in the first place, measures to be applied to aviation, the newest war arm, and the most damaging to the civilian population. It begins with the internationalisation of civil aviation. Subjects of signatory States will only be allowed to construct and use freely machines of non-military value and of a tonnage below a figure which will be fixed by the Convention. The construction and use of machines of a tonnage above this figure will be confined to Continental, inter-Continental, and inter-Colonial organisations placed under the auspices of the League of Nations, which will have a permanent right of requisition over them.

In the second place the plan proposes that the League of Nations alone shall have the right to dispose of heavy bombing machines of wide action radius—that is, of more than Y tons. Existing aviation authorities will retain complete freedom to use aircraft of less than a certain tonnage designated by Z, but will not be allowed to construct machines of a tonnage superior to Y. Only States which pledge themselves to place their forces at the disposal of the League of Nations in case of joint action by the League to prevent or to suppress war will be entitled to include machines of a tonnage between these two limits (Z and Y) in the air forces allotted to them.

By way of compensation, as it would be inadmissible for a State victim of aerial bombardment to be deprived of its freedom of action in order to reply to this flagrant aggression, each signatory, victim of such bombardment, will be entitled immediately, and upon the sole condition that the League shall be notified, to make use of all its air forces, including those which have been earmarked to be placed at the disposal of the League, and will *ipso facto* be freed from its own obligations *vis-à-vis* the aggressor.

An International Force

After dealing with bombing machines the French plan suggests that the following naval and military material shall be placed at the disposal of the League under exactly the same conditions:—Batteries of heavy long-range artillery, vessels carrying guns of more than 8-in. calibre or of more than 10,000 tons; submarines of more than N tons. In the fourth place the plan provides for the creation, by contributions from each signatory, first of an international police force to prevent war, and secondly of a first contingent of effective troops to come to the assistance of any State victim of aggression. This force will be at the disposal of the League of Nations, which will organise its command.

The French delegation goes on to point out that these offers call for political measures, among which are the acceptance of compulsory arbitration; the definition of an aggressor; precise guarantees regarding rapidity of decision by the authorities controlling the international force; the bringing of this action into conformity with international law, which is still insufficiently precise but the permanent and binding elements of which result from international treaties and pacts; and the international control of the execution of all agreements concerning armaments. The League of Nations has always recognised this thesis.

The Civil Population

To these proposals, which should be taken as a whole, new rules for the protection of civil populations are added

—prohibition of the use by aircraft or artillery of projectiles containing poison gases, bacteria, or materials which are specifically incendiary; prohibition of bombardments from aircraft or by artillery at more than X kilometres from the front line in land warfare; similar rules covering coastal bombardments, etc.

The plan, after recalling the reduction of armaments carried out in France since the entry into force of Article VIII of the Covenant and of the Locarno Agreements, finishes by affirming the necessity of laying stress upon the provisions for mutual assistance contained in the Covenant, which have hitherto always been interpreted along the line of least resistance.

Finally, it adds, the present Conference offers the greatest opportunity which has ever occurred for a definite choice between a League of Nations disposing of an executive authority and a League of Nations paralysed by the intransigence of national sovereignty. France has made her decision; she asks that other nations should make theirs.

THE BRITISH PROPOSALS

We take the following passages from the speech of Sir John Simon before the Disarmament Conference on February 8. The italics are our own. So much of his speech was applicable to all forms of warfare that to select only the passages which mention aircraft specifically would give a wrong perspective of the whole:—

"It must be the sincere and constant object of us all, by limiting our arms to what is strictly necessary for defence and for international obligation and by co-operation and comparison among ourselves, to discontinue all extravagant and fantastic claims and to fix the maxima in each case at as low a figure as possible. Only thus shall we demonstrate to the world and to each other our resolve to secure a real reduction. And while the broad objective of securing, in respect of the armaments of the world as a whole, a large percentage of reduction in the total, such as 25 per cent., is admirable, may I express the view that the maxima fixed for an individual State should be itself a permitted limit and that this will tend to reduce the figure better than by first asking for a named limit and then allowing a State to arm up to a fraction of that limit. The percentage reduction applied to an assumed figure in the future will only tend to make that assumed figure bigger than it ought to be. Not only our declared objective, but our methods of attaining it, should all be directed to the purpose, so far as possible, of securing not only a limitation but a reduction in armaments.

"As regards the second principle of treatment—namely, the outlawry by international agreement of certain weapons and methods of warfare—it seems to me that we are most likely to find these weapons and methods among the most recent developments. This is not only because it is the most recent lapses in habit which are the least difficult to eradicate, but because these new methods of warfare—the use of gas and submarines and of bombing from the air—all have this common feature, that they tend to obliterate the boundary as drawn by Hugo Grotius and maintained by the practice of modern warfare that so far as possible a distinction should be effectively drawn between combatant and non-combatant. For of all the horrible features which warfare presents, there is nothing which so fills the imagination with forebodings for the future, nothing which has more effectively evoked the protests and the appeals which we heard echoed in the petitions of Saturday, nothing, I would venture to say, which is so repulsive to all who are actually engaged in the profession of arms, as the promiscuous character of the destruction which modern war threatens. This is, indeed, a world conference on disarmament, for there is no calling however peaceful, no home however distant and humble, no innocence of life, no difference of facts, no immaturity of age which is not in fear of the consequences if the most modern methods of warfare cannot be curbed. . . .

"I mention two other recently developed manifestations of warfare which merit our closest attention. In 1925 there was signed the Protocol for the prohibition of the use in war of asphyxiating, poisonous, or other gases and of bacteria methods of warfare. In this Protocol plenipotentiaries of 44 nations declared that the use of gases in war 'has been justly condemned by the general opinion of the civilised world,' and the parties to this Protocol, in

(Concluded on page 144.)

Private Flying and Gliding

PRESS AERO CLUB

A club with the avowed intention of enabling pressmen to obtain flying instruction at low rates has been formed at Brooklands. The membership of the club will be restricted to bona-fide journalists and those engaged in the promotion of aviation in daily or weekly papers and periodicals. Arrangements are being made with the Brooklands School of Flying and the Brooklands Automobile Racing Club for the Press Aero Club to have associate membership to both, and honorary membership of the Cinque Ports Flying Club. The first 25 applicants will receive flying instruction enabling them to obtain their "A" licence for a flat rate of £30. The subscription for 1932 has been fixed at £3 3s. Those desiring further information should apply to the Hon. Secretary, Press Aero Club, Brooklands Aerodrome, Byfleet, Surrey. They will hold their first meeting on February 14.

EASTERN AIR TRANSPORT

Mr. M. D. L. Scott, who for the last two years has been carrying on joyriding and taxi work from Skegness, Lincs, has been offered a site suitable for a permanent aerodrome, and has decided to enlarge his interest by forming a private limited company (Eastern Air Transport, Ltd.) to carry on the same business on a larger scale.

This entails enlarging the present aerodrome site at Skegness to include roughly 40 acres, and within a year a further 40 acres, providing an area of 80 acres with clear approaches which should make a first-class permanent aerodrome. The filling-in of dykes and the leveling of the present site is well under way, and additional hangars, petrol pumps, and a club-house are being erected.

Since Mr. Scott started at Skegness some two years ago, he has carried over 10,000 passengers, besides last year running a daily service to Hunstanton and return, and also frequent taxi trips to various parts of the Midlands. The same work will be carried on this year, and in addition contracts have been secured for the carrying of evening newspapers. The machines to be used will be a "Puss Moth" and two "Gipsy Moths." The company has entered into an arrangement with Brooklands Aviation, Ltd., for the latter to carry out all renewals of Certificates of Airworthiness, complete overhauls and general servicing.

A club has been formed at Skegness, and there are some 50 members already. The club-house is in process of erection, and will be ready for use before Easter. Negotiations are in progress whereby all members of the Skegness Aero Club will be affiliated to the Brooklands Aero Club and Brooklands Aviation, Ltd. A warm welcome will be given all private owners and others arriving by air, and a telephone is being installed on the aerodrome. Arrangements have been made with the principal hotels in Skegness for accommodation for visiting pilots and passengers at reduced rates. The directors will be only too pleased to arrange accommodation, and for transport to and from the aerodrome, which is situated one mile north of Skegness.

It is intended to hold pageants at Skegness with the co-operation of the Skegness Council, on Whit Sunday and August Bank Holiday Sunday.

The aerodrome adjoins the North Shore Golf Club which, as is well known, is one of the best seaside courses on the East Coast.

CINQUE PORTS FLYING CLUB

The dinner and dance held at the Royal Pavilion Hotel, Folkestone, on January 30, was a great success. Ninety-four members and friends attended the dinner, and it was a great pleasure to all present to see the Hon. Mrs. Victor Bruce among the guests. Unfortunately, Mr. Charles Scott was held up on his way down, and did not arrive until dinner was over. Lady Chaytor and her eldest daughter were present, and also Messrs. Tommy Rose and James Handstock.

After the health of His Majesty The King had been proposed the Managing Director of Brooklands Aviation, Ltd., was introduced to those present in a short speech by Mr. H. E. Twaites, the former Hon. Treasurer of the Club. After his reply, Mrs. Victor Bruce spoke with her usual aptitude and humour, and was followed by Mr. R. Dallas Brett with a toast to the visitors.

The dance finished at 12 and the "afterwards" turned into a bacon and egg party, to which about 40 had been expected and some 120 attended!

Sir Robert Clayton-East was held up at Lympne on Friday owing to bad weather on the Continent. He stayed for the dinner and proceeded to Paris on Sunday. He is the latest recruit to the Club, and as a private owner it is to be hoped he will visit Lympne frequently.

Several new members and pupils have been enrolled during the past week, and the flying hours are increasing steadily.

Designs for a new luncheon room are in the making, as the present accommodation is too small to cope with the increasing demand by visitors and members.

AT BROOKLANDS

The School has been greatly hampered during the last week by fog; nevertheless, 30 hr. instruction and solo work have been carried out.

New pupils who have commenced instruction are Mr. Carling ("B" Licence) and Messrs. Roberts, Olive, Baily and Fremantle ("A" Licences).

The schoolboy pupils have now returned to school; their enthusiasm was incredible, and their smiling faces were to be seen on the aerodrome at the crack of dawn every morning, whatever the weather.

The overhauls for renewal of the Certificates of Air-



A MERRY PARTY AT LYMPNE: Reading from left to right are Mr. and Mrs. Joss, Mr. Mark Diamant, Steward Warner, Mr. Patterson, Miss Rambant, Mr. Sparkes, Miss Lilyan Chaytor, Mr. "Rab" Richarts, Mr. Eric Davis and Mr. Charles Scott telling secrets, Mr. Rambant (attempting altitude record), Lady Chaytor, Sir Robert Clayton-East and friend, and Capt. H. D. Davis.

worthiness have now been completed on all the School machines, so that they are now ready for a very busy summer. It is to be hoped that the weather prophets are right in their prediction of a fine hot summer.

Blind flying instruction is still going strong; full particulars can be obtained on application to the School.

The new club-house is progressing most favourably and will be occupied as soon as the furniture has been installed. The whole scheme is on very modern lines, but, nevertheless, most pleasing to the eye. The decoration is bright and cheerful and, in fact, more peculiarly suited to its own particular purpose than that of any building we have seen. The lighting is particularly adequate without being in any way glaring, and the provision of a clock in almost every room is only one of the very careful ways in which the comfort of the Club members has been catered for. The design of the bar is worthy of study by everyone who wishes to provide a maximum of comfort in a minimum of space. The architect, Mr. Dawbarn, is to be congratulated on his work.

BRISTOL AND WESSEX CLUB

Amongst the fixtures which should be remembered by everyone interested in flying in the West Country is that of the Bristol Airport Summer Flying Meeting to be held on Saturday, June 4. Users of that aerodrome should also remember that the new telephone number is Bristol 25144.

READING

The annual dance of the Reading Aero Club will be held in the clubhouse on Saturday, February 13. Both the club and the school are progressing in a very satisfactory manner indeed, and those who would like to know more about the school's activities should write to Phillips & Powis, Ltd., Reading Aerodrome, mentioning FLIGHT, for a copy of the latest booklet which they are issuing, describing all there is to be found at Reading. This little publication is attractively arranged, and confines itself to the essential facts which anyone proposing to learn to fly will immediately wish to know. It deals not only with the costs of flying but also with the accommodation to be found in the clubhouse, the situation of the aerodrome, the training which may be obtained in the shops, and many other points of interest.

THE AIRCRAFT CLUB, HARROGATE

Beginning with a joint meeting with the York and Malton Clubs at Saltersgate on February 14, the Aircraft Club have arranged an excellent programme of fixtures. There will be an Easter meeting on the north-east Yorkshire hills and a Whitsuntide one at Harrogate. For July, arrangements are in progress for a meeting with the Ilkley Gliding Club at Beamsley Beacon, while on August Bank Holiday it is hoped to hold another meeting with the Yorkshire Club. Maj. J. W. Hills, M.P., has now become President of the club.

The Aircraft Club was the first one in the north to take up serious gliding, and has trained many *ab initio* pilots to the stage when they can soar on the machines built by the club. The position at the present time, however, is serious, as the finances of the club are by no means in a strong position. The Beamsley site is undoubtedly one of the best in the country, and it is hoped that those responsible will see their way to making more use of this in an official manner in the future. Such recognition would give a fillip to the movement in the north, and, it is hoped, increase the number of members, thus ultimately placing the club in a more secure position. Mr. E. W. Addyman, the Hon. Secretary, who has worked so hard for the club since its inception, has been re-elected in that position, and at the annual meeting, held on January 16, he voiced a plea for members to come forward more readily with their subscriptions and to bring many more supporters with them.



Modified Dickson Glider built by the Aircraft Club, Harrogate, soaring over the Hole of Horcaun, near Saltersgate.

THE B.A.T. SCHOOL

Fog at Croydon has greatly hindered the operations of the school during the last week. Notwithstanding this, however, Messrs. R. E. P. Bliss and J. T. Percy completed their "B" licence tests together with their night-flying test at Lympne. Two others who have completed all the necessary flying and are waiting on the weather to do likewise are Miss Warliker and Mr. Moore-Boyle. Miss Warliker is not yet 18 years old, but has considerably more flying to her credit than the requisite 100 hours, and has flown solo on five different types of aircraft. Messrs. Cairns, Dowding, Ballantine and Kendal have all progressed so far as to have reached the stage when they are ready to take their "A" licence tests, while Messrs. Price, Deacon and Messenger hope to gain their "B" licences shortly.

YORKSHIRE AEROPLANE CLUB

The Yorkshire Aeroplane Club will be holding their annual dance in the Town Hall, Yeadon, on Friday, February 19, from 9 p.m. to 2 a.m. Tickets 5s. each, including supper, may be obtained from members of the Committee or at the clubhouse. These dances have always been outstanding successes in the past, and it is sincerely hoped that members will do their best to support this one, as they have always done before, and so continue to make it an attractive function.

FACILITIES AT LITTLESTONE

Littlestone emergency landing ground is now frequently being used by aircraft when other aerodromes are blanketed in fog, and it is therefore of great interest to all pilots to learn that Paymaster Commdr. Cooper, R.N.R. (Tony's House, Jesson, New Romney, Kent), has arranged to provide facilities for any pilots who land there. His house adjoins the aerodrome, and he has available two spare bedrooms, with hot and cold running water in each, telephone, central heating, bath, electric light and meals. Furthermore, his car is at the disposal of any pilots or passengers for day or night use. He is also qualified in first aid, and has everything necessary for dealing with any emergency which may arise. His charges for the use of his house are extremely reasonable, and are: bed and breakfast, 10s.; dinner, 3s. 6d.; tea, 2s.; lunch, 2s. 6d.; baths, 1s.; car hire, 10d. per mile, while his telephone number is Dymchurch 75.

THE BRITISH GLIDING ASSOCIATION

The Council, after duly considering the desirability of forming the Association into a Society with limited liability under the Industrial and Provident Societies Acts, 1893 to 1928, have come to the decision that this is advisable.

The statutory rules which have to be incorporated to conform to the regulations of the Act make the alterations to the present Association Rules very numerous, and the Council have therefore decided to adopt a new set of Rules.

The proposed new Rules may be inspected by any member at the office of the Association, 44A, Dover Street, W.1, any day prior to the Annual General Meeting (on February 22) between the hours of 11 a.m. and 3 p.m. (Saturdays excepted).

The Annual General Meeting will be held in the Library of the Royal Aeronautical Society, 7, Albemarle Street, London, W.1, at 6.30 p.m.—not 7.30 p.m. as before announced.

THE MANCHESTER GLIDING CLUB

At a meeting of the Royal Aeronautical Society, Manchester Branch, held on Friday, January 29, at the Grand Hotel, Manchester, under the chairmanship of Mr. R. H. Dobson, it was decided that the Stockport Gliding Club should amalgamate with the gliding section of the Royal Aeronautical Society under the heading of The Manchester Gliding Club.

It was pointed out that this step had not been taken

because of any lack of enthusiasm or any falling off in the membership of either club, but purely as a measure which would ensure the economical working and future efficient development.

The new club would cater, even more extensively than previously, for those interested in the sport of gliding and sailplaning. To this end a very ambitious and comprehensive programme is being arranged by the committee.

The chairman expressed his pleasure with the financial position and general standing of the club, saying it was a creditable position in which they found themselves, commencing a new season with over 50 members, two sound gliders and about £20 cash at bank.

Mr. R. Chadwick, who was elected chairman for the ensuing year, in a short speech after his election said it was quickly apparent that the splendid enthusiasm and eager determination displayed by the members of the Manchester Gliding Club would, he felt, ensure for them a season of successful flights and thrilling achievements, and he took the opportunity at the commencement to wish the club good luck and "soft landings."

THE NORTH KENT GLIDING CLUB

The club activities have been rather limited during the past few weeks, but have now commenced seriously again.

On Sunday, January 24, thanks to the kindness of Mr. York Bramble and the Southern Soarers, a party from this club was able to proceed to Balsdean and put in some hours of very useful training. By the end of the day every member had had at least one "flip," whilst Messrs. Hills, Liddington, Owen, Pass and Richardson, and the first lady member, Miss Rodeveril, succeeded in qualifying for their "A" Certificates, Mr. Richardson distinguishing himself by a smooth straight flight of 45 sec.

It is quite a justification of the club policy of training members by auto-launches on the flat that in three Balsdean visits they have managed to secure 13 "A's"—the majority by members who have never been shot off a real slope in their lives before—without a mishap to the veteran B.A.C. II.

The Annual General Meeting of the club was held at the Bexley Heath Constitutional Club on the evening of Monday, January 25, Mr. Howard presiding in the absence of the President, Mr. Dixon. The balance sheet displayed a pleasant credit balance on the year's working.

The model section has a membership of over 60, and a financial balance well on the right side.

During 1931 the B.A.C. II machine was used for some 750 launches, and, in spite of minor alterations which have slightly altered its weight, it continues to fly well. Repairs have been done by club members under the supervision of our ground engineer, Mr. H. Jiggins.

LONDON GLIDING CLUB

The London Gliding Club has been doing a great deal of flying recently, and every week-end finds their machines almost continuously in the air. On Saturday, January 30, the weather was particularly unfavourable, and it was only after midday that there was any appreciable up-current from the wind against the hill. The "Kassel 20" was flown by Dr. Slater, on whom a particularly difficult landing was forced by the lack of wind; the excellent control of this machine, however, enabled him to do this successfully. In the "Prüfling" Mr. Alan Goodfellow managed to secure his "B" licence with an excellent flight of 70 sec., despite his avowal that the machine was not built for carrying heavy weights. Other pilots who also made successful flights were Hedges and Brame, the latter completing his first flight from the top of the hill without any trouble whatsoever. The "Professor" was also a great deal in the air, flown by D. C. Smith; Scott-Hall, who found her very long float somewhat of a drawback when landing; and several other pilots. The "Dagling" was in great demand for those obtaining their "A" licences, amongst whom was Dewsbery, who did so with a flight of 51 sec. A new "Zögling" class which had been started on Saturday was composed of eight entire beginners, all of whom received five flights each. The club's annual general meeting will be held in the library of the Royal Aeronautical Society on Wednesday, February 17, at 7 p.m.

An Aerodrome for Bundaberg

SAID to be the second best in Australia, an aerodrome was opened last December at Bundaberg, Queensland, Sqd. Ldr. Bert Hinkler's home town.

President Hoover Inspects the Autogiro

THE Cierva Autogiro Co. have received the following item of interest from their Associate company in America:—"Senor Don Juan de la Cierva—inventor of the Autogiro—together with Mr. Harold F. Pitcairn, sponsor of

the windmill aeroplane in America, flew Autogiros to the White House, Washington, where they were entertained by President Hoover to luncheon, other guests being Col. Clarence Young, Assistant Secretary of Commerce for Aeronautics, and Luis M. Deirujo, Spanish Charge d'Affaires. President Hoover showed great interest in the machines and asked many questions about their progress and development. He was extremely kind and cordial to Mr. de la Cierva."



VIEW WITHOUT DRAUGHT: The Buhl Aircraft Company of Detroit has recently completed the first Autogiro "pusher," and the machine has been flown by Mr. de la Cierva, who is visiting America at present. The photograph on the left shows Mr. Cierva in conversation with Mr. Harold Pitcairn, President of the Autogiro Company of America. In the right-hand view the machine is seen in flight. It will be noted that the pyramid which carries the rotor head is very tall, so that the occupants can even stand up in the nacelle without being decapitated. The new machine is very reminiscent of the early pusher aeroplanes of Mr. Henry Farman.

Air Transport

The Organisation of Air Routes for Night Flying

On Feb. 4 last Dr. Rudolf Benkendorff, of Berlin, read a paper on the Organisation of Air Routes for Night Flying before the Royal Aeronautical Society (with which is incorporated the Institution of Aeronautical Engineers). Night flying is an important side of commercial aeronautics of to-day which is slowly but surely developing as the problems involved in its operation are being solved. We therefore publish below Dr. Benkendorff's paper in full

“THE operation of scheduled night flying presents two tasks to aviation:—

(1.) The technical task of taking off from and landing on an aerodrome.

(2.) The operation of the flight from one aerodrome to the other.

“The first task presents no completely new problem, as sufficient experience was gained during the war. All that was necessary was to provide facilities which guaranteed regular traffic.

“The second task was purely one of navigation. It had to be solved in accordance with the strict demands of maximum safety and maximum regularity of the service. The only means of navigation then available, the compass, was not sufficient for these requirements, and at night it was not possible to count on keeping on the course by observing objects on the ground.

“In order to show the direction taken by the development of navigation in night flying, and what ideas led to actual safety conditions in night flying, I will give a short survey of the development of the organisation of night flying in Germany from 1926 to 1931.

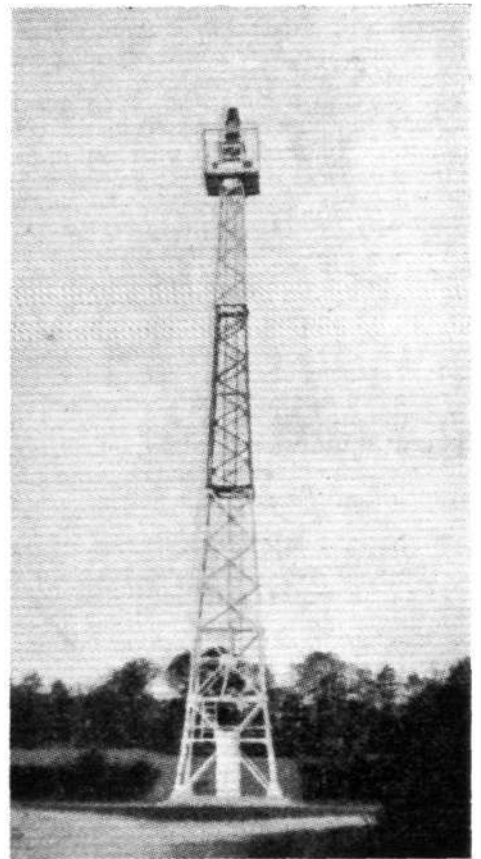
“Apart from the night flying experiments carried out in 1924 and 1925, which are unimportant for our subject, the first regular scheduled night air service for the transport of passengers, freight and mails was operated on the line from Berlin to Königsberg, in 1926. Multi-motor aircraft of the Junkers and Albatros types were employed. The aircraft were fitted with wireless equipment, and the wireless ground stations of Berlin, Danzig, and Königsberg were available for the airway, which is 425 miles long. It must be remembered that wireless direction finding did not exist at that time, and that it was not then possible to think of blind-flying for longer distances. If the necessary safety and regularity were to be attained, airway lighting had to be instituted in order not to be solely dependent on the compass.

“Starting with the idea of always keeping the right course, even when the visibility is bad, a close line of beacons was erected: principal airway beacons (revolving beacons) every nine miles, and intermediate beacons with a longer range every three miles. In addition, emergency landing fields were prepared every 50 miles—with personnel to give traffic signals to the aircraft, send weather messages, and be ready to render assistance in case of a forced landing. The development of this night traffic is intimately associated with the name of Capt. Köhl.

“Even then, there was no doubt that flying along such a close line of beacons when the visibility was bad kept the pilot within dangerous vicinity of the ground. But no other solution could be found at the time, if night air traffic was not to be abandoned altogether. Night traffic was the only form of civil aviation which gave promise of economic development, in view of Germany's situation in the heart of Europe.

“The lighting of the line from Berlin to Hanover, which is 155 miles long, was built in 1928, in accordance with the same principles, with principal airway beacons every 17 miles and electric or gas intermediate beacons every three or four miles. In building this line the beacons were placed for the first time in a bee-line.

“Ideas regarding the method of airway lighting under-



Principal airway beacon.

went a fundamental change when blind-flying was introduced into civil aviation, and a network of direction-finding stations was erected for the purpose of giving position, direction and course to aircraft in flight by wireless.

“Two technical developments which had a decisive effect on the organisation of night airways became available almost at the same time for utilisation in scheduled flying. The safety of night flying was thereby decidedly increased. The pilot was able to avoid the dangerous vicinity of the ground when the clouds were low and the visibility bad. Direction finding provided him with a safe means of navigation which supplemented the compass. Thereby the task of airway lighting was fundamentally changed in that it was limited. The following considerations arose at the time, considerations which still form the basis of airway lighting in Germany:—

“If the atmospheric visibility diminishes to less than a distance of between three-quarters of a mile and one mile, it is in the interest of safe flying not to fly by the beacons, but to fly blind at an altitude which excludes any collision with the ground or with the highest points in the neighbourhood of the air route. The aircraft can be steered to its destination with the help of the compass and direction-finding much more safely than can be done with the help of beacons.

“Thus, airway lighting is only of importance for atmospheric visibility greater than from three-quarters of a mile to one mile; its character had to be changed accordingly.

“The following further consideration arose: The flash of a strong revolving beacon is visible from $1\frac{1}{2}$ miles under conditions of atmospheric visibility of one mile. If we reckon in squally weather with a maximum deflection of the aircraft to six degrees on either side of the course, a distance of 15 miles between the beacons is sufficient, when flying on the beacon line, to get in sight of the next beacon in every case.

“In view of these considerations, all new lines of airway lighting were constructed in accordance with the following principles:—

- (1) Revolving beacons at intervals of 15 miles.
- (2) All beacons in a bee-line between the aerodromes.
- (3) Only electric lighting, as gas lighting is not sufficiently intensive and too expensive in working.

“Between 1929 and 1931 the following beacon lines were erected:—

- (a) From Hanover to the Dutch frontier, in the direction of Amsterdam, distance 112 miles; branching

off from it and avoiding the Ruhr industrial area owing to its hilly character and the prevailing bad visibility.

- (b) Branch line to Cologne and the Belgian frontier in the direction of Brussels, 145 miles.
- (c) From Hanover to Fehmarn, in the direction of Copenhagen, 158 miles.
- (d) From Berlin to Halle/Leipzig, 90 miles.

"The intermediate beacons on the line from Berlin to Hanover were extinguished, and on the line from Berlin to Königsberg only the Neon intermediate beacons, which are very cheap to work, are still in use.

"The total length of the lighted airways is 1,085 miles, and is illuminated by 97 principal airway beacons and 38 intermediate beacons.

"The characteristic of the beacons is uniform, being:

2.8 sec. dark period.
0.2 sec. flash.

3.0 sec. revolution.

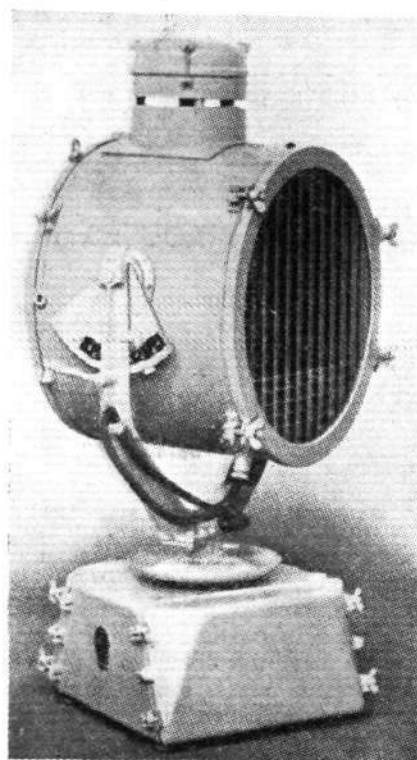
"The choice of characteristic was based on (1) bringing as much as possible of the light produced to the pilot's eye, and (2) adjusting the repetition of the flash so that the pilot has no difficulty in finding the light again. I will return to the characteristic when discussing the problems.

"The following technical details of the lighting may be mentioned:—

"The beacons are installed on iron masts from six to seven feet high. The following types are in use: Rotary reflector lights with a reflector $24\frac{1}{2}$ in. in diameter and with rotary lens lanterns of which the concentric glasses are from 15 to $20\frac{1}{2}$ in. in diameter. All lights have an automatic device for changing the lamps, which are from 1,000 to 1,500 watts. Rotary reflector lights and rotary lens lanterns thus give a light of from 1,500,000 to 2,000,000 Hefner candle-power, which represents a candle-power of 400,000 Hefner candles for the pilot's eye, and a range of from 30 to 40 miles. The beacons are turned off and on by special automatic switches attached to each beacon. One electrician is in charge of every 150 miles of the line, and it is his duty to keep the beacons in order and put right breakdowns.

"There are, in all, 14 ground direction-finding stations for the entire air service, of which those at Berlin, Hanover, Hamburg, Dortmund, Cologne, Erfurt, Stettin and Königsberg are available for night flying. The method employed is that the bearing of the mobile station is taken by the ground direction-finding stations on the aerodromes according to the minimum method. The Telefunken frame direction-finder is used. These 14 direction-finding stations are so distributed over Germany that they give favourable angles for position finding for every place in Germany. Experience shows, however, that aircraft ask for direction or course in most cases, and that position is only asked for from time to time for purposes of verification.

"The difficulties which arose at first owing to the great deviations of the beam at sunset, night and dawn may be said to have been overcome. A practical method of direction-finding has been developed which gives the fixed bearing, if the bearing is taken in the first few seconds after the aircraft transmitter is switched on. No scientific explanation of this has yet been given.



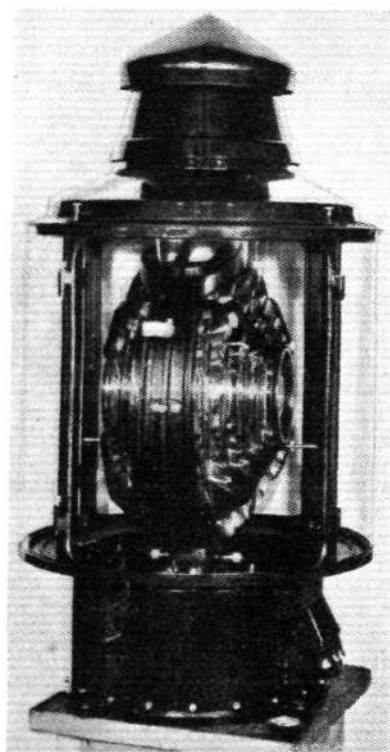
Rotary reflector beacon, $24\frac{1}{2}$ inches diameter of the reflector, type Siemens-Schuckert.

thoroughly effective. So far there has been no necessity to make use of floodlighting, which is expensive to instal and run. The use of stable lanterns has not led to any accidents occurring.

"The aviation weather service for night traffic is based on the same principles and methods as have proved effective for the safety of day traffic. The daylight arrangements are supplemented by the regular measurements of the height of the clouds by means of ceiling projectors, and the measurement of humidity on the aerodromes and emergency landing places, in order to facilitate the fog forecast, which is of great importance for night flying. A special night staff of meteorologists is maintained on the aerodromes at Cologne, Hanover, Berlin and Königsberg.

"It is unnecessary to go into details, as the weather and wireless services for aviation have been regulated by international agreement. The many years' work of the International Air Conferences have resulted in the adoption of fundamental lines of co-operation which are embodied in the Regulations for International Weather Service for Aviation and the Regulations for International Wireless Service for Aviation.

"I need hardly mention that the safeguarding of night flying is still occupying the attention of experts. I should now like to touch briefly on the questions which, in the opinion of experts, are at present most pressing. In this connection I should like to quote the words of the late Sir Sefton Brancker, whose loss we all deeply deplore. During a discussion on the subject of airways lighting, he remarked: 'We don't need any lighting, for we can't see it in bad weather, and in good weather we don't need it.' There is a good deal of truth in this remark, but I venture to think that it must be taken with a grain of salt. True, we can fly blind now, and direction-finding and the compass are good means of navigation. But it must not be forgotten that the direction-finding service may be interrupted or have breakdowns caused by atmospheric or thunderstorms. It must also not be forgotten that considerably less strain will be put on the



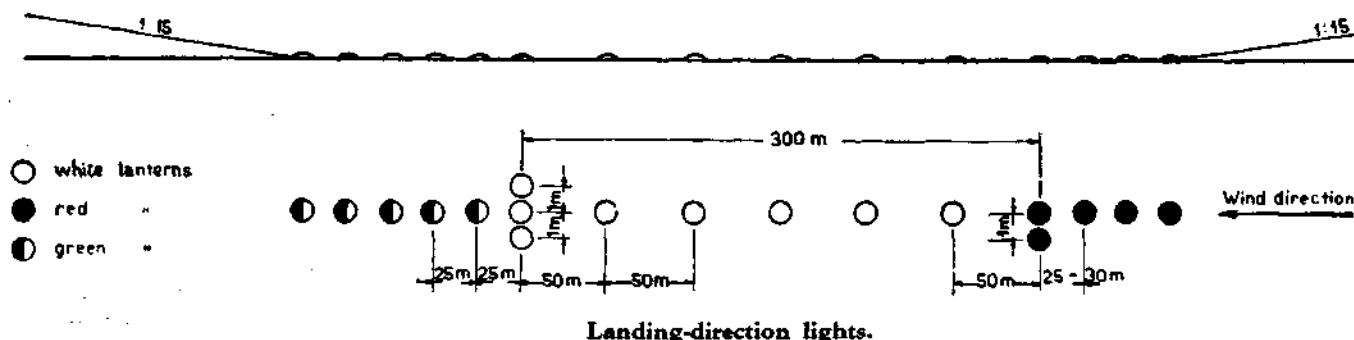
Rotary lens lantern, type D.L. 150 Pintsch.

nerves of the pilot if he can fly along a lighted airway when the visibility is good, a fact which must not be underestimated in the interests of the crew. For the minimum visibility of about one mile, airway lighting will always retain its importance.

"An aircraft is not like a ship, which can slow up or even stop when there is any doubt about the navigating measures to be taken. Unfortunately, an airman must always know what course he has to take, and, in case of doubt, at once have all facilities in order to avoid making

service for aviation. The International Aviation Lighting Committee has already done valuable pioneer work in the matter of standardising the technical terms, scientific physical research, and the treatment of questions concerning airway lighting. But practice must be decisive in these matters and utilise experience. It will be easier to arrive at a uniform point of view in this way, for practical airmen are more likely to agree than scientists.

"The longer the delay in arriving at uniformity, the more difficult will it be to do so, for the question of the



Landing-direction lights.

wrong decisions. The reasons which have led, and will still lead, us in Germany always to maintain good lighting of the airways are maximum safety for flight operations and minimum strain on the crew and material.

"It is impossible yet to say whether beacon distances of 15 miles are the last word in wisdom. There are many people, even in Germany, who are in favour of greater distances, for instance, 20 and even 30 miles. But this must be decided on the basis of a thorough examination of the results of experience. This is the tragedy of all safeguarding services, not only in aviation, that their importance and efficiency cannot be proved by statistics. For, unfortunately, we cannot say how many accidents have been avoided by the use of the safeguarding services. Therefore, if all we have to go upon is experience, we ought rather to do a little more than a little less in the interest of safety, as there is a personal factor in all experience.

"In the issue of 'Aircraft Engineering' of October, 1931, I read in an article on Ground Lighting Equipment that airway beacons must be distinguished by their colour, strength and characteristic. We are of the opinion that all airway beacons must be white and have the same characteristic. In theory, it may seem very convenient that airway lighting should serve not only to give the direction or course, but also the position. These are ideas which seem to be derived from the practice adopted in marine and coast lighting, which cannot be adopted in aviation without objection. The aircraft moves at much greater speed, and the pilot's main business is the steering of the aircraft. He can only devote part of his attention, perhaps from 20 to 25 per cent., to observing the lighting. He cannot observe the direction and characteristic of the beacons at leisure, as the naval officer does, for the line of beacons can only give him the direction—if he is not to be asked to do more than he possibly can. Mistakes in determining the characteristic will always have very serious consequences in aviation. The use of coloured glasses in airway beacons has the great disadvantage that it greatly decreases their range.

"We have often discussed in Germany whether we ought to attach illuminated letters or figures, identification lights or course lights to the beacons, as has been done in the United States. It cannot be denied that these arrangements may have a certain value. So far we have dispensed with all such additional arrangements, as they do not change the fundamental idea of the lighting, and their installation does not appear desirable to us until an international agreement has been arrived at on the subject.

"The organisation of the safeguarding of night air routes is, in my opinion, to be regarded, not from the national, but from the international, standpoint. The present night line from London to Berlin, for instance, which is flown in 6½ hours, passes over three or four countries. It cannot possibly increase the safety if the pilot encounters three different systems of lighting during the course of his flight. The air line, and not the State, must be regarded as the unit for which standards must be found.

"The International Air Conferences have already laid down these standards for the wireless and meteorological

cost of changing existing lighting arrangements will always stand in the way."

In reply to the queries raised during the discussion, Dr. Benkendorff said that he considered the Croydon type of wireless beacon was only good for flying along one direct route, such as that from Croydon to Paris, and he did not think that it would be effective in Germany, where there was a network of routes to cover. With regard to the question of passengers *versus* mails, he said that the present practice in Germany was chiefly to carry passengers to the east and mails to the west by night. Flood-lighting he did not consider was of very great value for landing by night except where the aerodrome was perfectly flat, as the presence of slight undulations in the aerodrome caused deep shadows, which made matters very difficult for the pilot. He therefore maintained that the German practice of using stable lanterns was a better one, although he freely admitted that the floodlighting would be best if flat aerodromes were obtainable. He agreed that beacon lights would require to have varying characteristics when there was an international agreement as to the form these characteristics should take, but until that time came he maintained that the German method of having one characteristic for all beacons was the simplest and safest method. Dr. Benkendorff agreed that both wireless and lighting for the control of night flying should be developed together, as they were actually dependent upon each other. Tests were being carried out in order to set a standard of visibility for weather reports at night, but up to the present nothing definite had been settled. In answer to a query about night errors from directional wireless bearings, he said that they could not account for the fact that their operators found that bearings taken in the first few seconds were correct; he could only say that it was so. In answer to a question about the cost of lighting, Dr. Benkendorff said that although he agreed that the first cost was large, he thought that it was a very great economy, since the money spent in one year in Germany was only half that which would be expended in replacing one large aircraft should a crash occur.

Following Dr. R. Benkendorff's Lecture a dinner was given in honour of the lecturer by the President of the Society, Mr. C. R. Fairey, M.B.E., F.R.Ae.S. The President was unfortunately prevented by illness from attending the dinner, and in his place Major T. M. Barlow, M.Sc., F.R.Ae.S., Chief Engineer and a Director of the Fairey Aviation Co., occupied the chair. The other guests included: Lt. Col. F. C. Sheldermine, C.I.E., O.B.E., Director of Civil Aviation; Herr A. H. Van Scherpenberg, Secretary of the German Embassy; Mr. F. Handley Page, C.B.E., F.R.Ae.S.; Mr. Nigel Norman, B.A., A.F.R.Ae.S., Airwork, Ltd., Heston Air Port; Capt. F. Entwistle, B.Sc., Meteorological Office; Dr. Ing. G. V. Lachmann, A.F.R.Ae.S.; Maj. R. H. S. Mealing, Chairman, Lighting Committee of the Dept. of Civil Aviation; Mr. R. A. Jahn, Deutsche Luft Hansa; Mr. C. E. Kauffmann, Royal Dutch Air Lines; Capt. J. Laurence Pritchard, Hon. F.R.Ae.S., Secretary of the Royal Aeronautical Society.

Airport News



The Shushan Airport

*An Ambitious Scheme
for New Orleans*

By E. ALLEN RICE

(Concluded from page 116.)

New Type of Administration Building

THE approach to the main entrance of the Administration building is through large arched doors of panelled Apitong wood. The doors lead into a spacious waiting room, two storeys high, with iron balconies extending the full length of the room on either side. For the needs and comforts of the passengers there has been designed a large attractive dining room, with lunch counter, spacious lounging rooms, drug store, barber shop, and cleaning establishment. The actual work of operating the port has been mitigated by the centralisation of all offices pertaining to the management. Outgoing and incoming customs offices and passport office are in one group, ticket office, foreign exchange office, and passenger agent in another; in close proximity, the Manager's office, telephone, telegraph and radio room. A sub-post office is located at the end of the east wing, with entrances from the waiting room and the field.

The second floor is devoted to offices and quarters for various organisations. A new feature in connection with the pilots' quarters is a library and large recreation room. On this floor is also located the Department of Commerce suite.

Glass Control Room

On the third floor of the control tower, consisting of one room, are the batteries, panel boards, and other equipment necessary to operate the radio system, public address system, and mechanism for the control of field and traffic lights. On the fourth floor is the control room, completely enclosed in glass, affording unlimited visibility in

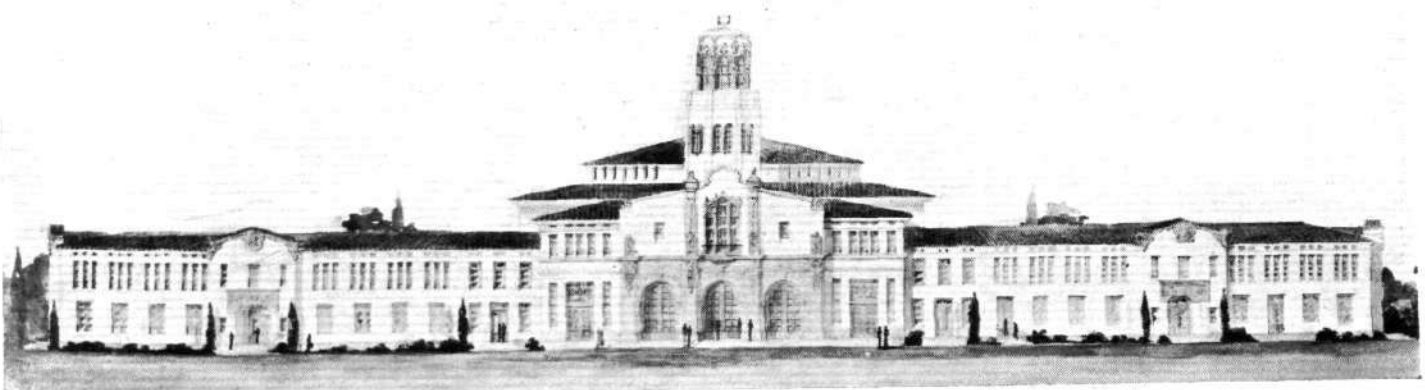
all directions. Here are the remote controls for beacons, field lights, traffic signals, radio telephone, and master teletype equipment. On the top of this control tower is the latest approved type of airport beacon.

Maintenance and Emergency Building

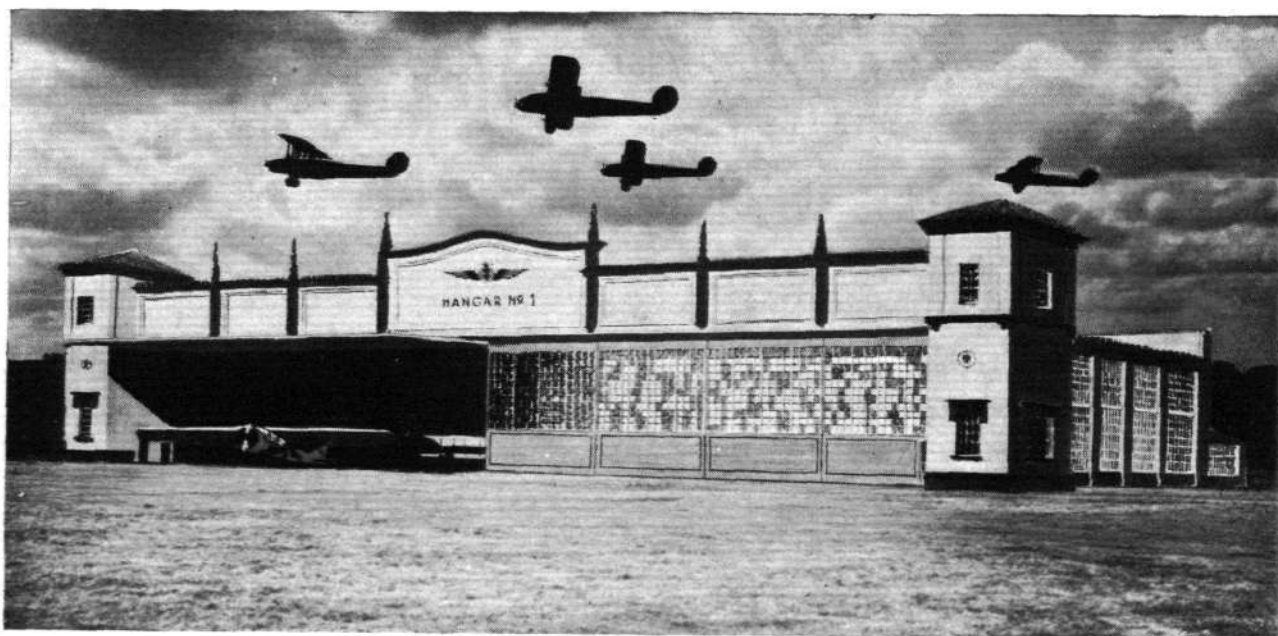
Adjacent to the Administration building, facing the field, is the Maintenance and Emergency building. This includes a modernly-equipped hospital. In connection with the hospital is the ambulance garage. The emergency fire-fighting equipment is also quartered in this building. In the rear of the building is storage space for all port maintenance equipment, such as stock rooms, tractors, ploughs and motor-cycles. Ample space has been provided in this building for any developments that may take place in the future expansion of the port.

Concrete Piles Support Hangars

The two hangars being built in the initial development are of the very latest and modern design. Each hangar is 120 ft. x 200 ft., supported on concrete piles driven into the ground, upon which is placed reinforced concrete foundations supporting the structural steel. The trusses are of cantilever type, providing an unobstructed opening 25 ft. 10 in. high for the full length of the building. This type of construction is approved by the Board of Fire Underwriters for low rate of fire insurance. The floors and walls are of masonry; the exterior sash are of steel. Cantilever-type steel doors, mechanically operated, swing out over the court, providing an additional



THE SHUSHAN AIRPORT: The illustration on the top of this page depicts the front, or street, facade of the Administration Building, showing the Spanish Renaissance architecture reminiscent of Old New Orleans. The lower picture is of the aerodrome facade of the same building.



THE SHUSHAN AIRPORT: Drawing of one of the hangars, showing the cantilever door, which provides an additional sheltered area of 25 ft. by 200 ft.

sheltered area 25 ft. \times 200 ft. There will be installed in the floor of the hangar, at conveniently located positions, ground plugs for the grounding of aeroplanes. This new safety feature prevents fires by static electricity created by men working on and around aeroplanes. A modern sprinkler system is being installed in each hangar. At the rear of the hangar are shop facilities for minor repairs; lavatories and locker rooms for men and women pilots. Here will be stored their parachutes and flying gear.

The latest in modern equipment is to be installed in the Repair building. The building itself will be of the factory-hangar type. It will be well ventilated and modernly equipped for the repair of all types of aircraft and motors. The architecture of this building will harmonise with that of the other buildings of the airport.

Indirect Lighting of Buildings

The interior roads on the airport will be illuminated by standard lamp-posts designed to harmonise with the airport surroundings. The fountain at the entrance will be flood-lighted with colours, producing an unusual and beautiful spectacle upon entering the driveway. The walls of the Administration building will be flood-lighted from various locations on the ground and in hidden places on the walls of the building. This will produce a picture of the building in relief at night, emphasising the beautiful lines of the building. The taxiway and court area between the buildings will also be flood-lighted, so as to permit the operation of aircraft and others on the ground at night with the same safety and efficiency as in the day time.

New Type of Flood Lighting

Around the entire bulkhead, which approximates 6,500 ft., are placed boundary lights, 200 ft., on centres. These boundary lights will give a definite outline of the airport at night. Placed at proper locations at the end of runways or landing strips will be green lights, denoting to the pilot the safest approach and location of the runways. At the end of each runway will be placed twin flood-light units. The beams of these flood-lights will carry the entire length of the runway, and are placed at angles so that, regardless of the angle of the machine landing, the beam will not be reflected from the wind shield to the pilot's eyes. These flood-lights will be turned on at the command of the pilot, designating the direction of the wind as well as flood-lighting the runways.

A new departure in marine flood-lighting, which has been tried out by experiments over the past three years, will be used in flood-lighting the seaplane landing area. The flood-lights will be placed on the west side of the area used by the seaplanes in landing. The rays of the light will be controlled mechanically and adjusted to the various heights of the waves, designating to the pilot the size and direction of the waves, as well as illuminating the area.

Three-Unit Beacon

At the corners and the extreme high points of each building on the port will be placed a red obstruction light. On the buildings near the line of approach will be flood-lights—vertically and on the roof—to give the pilot a prospective of this near obstruction. On the top of the tower of the Administration building will be placed a regulation airport beacon, of the three-light unit type, one light showing a green beam, one an amber beam, and one a white beam, revolving at 6 r.p.m. Along the entire south end of the field, on top of each telephone and telegraph pole, will be placed a red obstruction light.

Remote Control of Field Lighting

All obstruction lights, boundary lights, and approach lights will be controlled by one control switch operated by remote control from the assistant manager's office, as well as by torch clock and sun valve. This gives the manager absolute control of field lights at all times, and, in case of emergency, all the exterior lights of the field can be operated from this office.

Located on the field, easily visible to the pilot in the air, will be an illuminated wind tee with directional dial placed in the assistant manager's office. It will be connected by wires to the remote control board, which, in turn, flood-lights the runways indicating the wind direction.

The transformer building which will house all master switches, oil switches, transformers, relays, and master switchboard, together with all lightning-arresting equipment, and an emergency generator set of sufficient capacity to produce enough voltage for the entire project. This generator can be cut in by remote control from the manager's office without losing any time in making the switch over.

Port to Ship Radio Channel

Located in a room in the tower of the Administration building will be a complete radio system of two-way telephone and telegraph type. From this room pilots will be advised of weather conditions on the port and other information; and at the same time pilots can advise the airport as to their location and needs. Passengers will also be able to send messages from the plane to their homes or business offices.

New Era for New Orleans

New Orleans has long felt the need of a great airport comparable to her busy seaport and railroad terminals. The Shushan Airport will fill this need. This modern, efficient commercial airport, strategically located, will be to New Orleans what her seaport and railroad terminals have been—a great stimulant to trade with Mexico and South America. The Mississippi valley and the entire United States will be brought closer to world trade by New Orleans' farsightedness in building this project. It marks a new epoch in aerial progress in America.

CROYDON

THE past week has been very uneventful, and there is little of interest to record. Weather has been variable, fog having been the main trouble. As usual, when it has been fine and sunny in England, it has been foggy abroad, and *vice versa*, but services have been unaffected and have all run to schedule.

Lady Bailey successfully completed her night flight for her "B" licence on Saturday night, and is now a fully-qualified commercial pilot.

On Saturday afternoon, one of the Klemm monoplanes of British Air Transport had an argument with one of the boundary lights, which resulted in a decisive victory for the boundary light. This was the first day out after overhaul of this machine; it is now back in dock stripped right down.

On Sunday a gentleman arrived at the aerodrome in a taxicab in a state of great excitement, and wanted to book a special to take him to Liverpool. Suspicions were somewhat aroused by his peculiar actions and claims he was making. He claimed to be the "Son of Man" returned to earth. He was, however, quickly returned somewhere else, much to his indignation and annoyance. There have

been cases before here of this type who have somehow managed to get at large, but their freedom is short-lived, as it is usually possible to realise that there is something that is hardly normal.

Joyriding was out of the question on Sunday, as fog persisted locally throughout the whole of the day. Croydon is about the worst possible place there could be in this respect, as we have said before, in proof of which Sunday was another good example. It is often a fact that within half a mile of the aerodrome glorious sunshine prevails whilst the aerodrome and its outskirts are enveloped in a dense black-out. Pilots Wheeler and Travers, of Imperial Airways, are under orders to proceed East, and are, I believe, likely to be out there for quite a long period this time. Such is the life of a pilot. It looks as if the old saying, that sailor has a home in every port, will become these days applicable to a commercial aircraft pilot, so far that he never knows where he will be from one week to the other.

The traffic figures for the week were:—Passengers, 511; freight, 27 tons.

P. B.

Airisms from the Four Winds

Lost—and found in African Deserts

R.A.F. pilots, French long-distance airmen, and a French woman pilot have all experienced exciting adventures in African deserts during the past week. On February 6 a Flight of 11 Wapiti machines belonging to No. 55 (Bomber) Squadron, R.A.F., engaged on a flight from Baghdad to Cairo, got caught in a snowstorm (no—this is not a misprint!—Ed.) over the Syrian desert, and three of the machines lost touch with the others. Five reached Amman and three others landed at Imtan. Planes and motor cars were sent out to search for the three missing machines, two of which were located on February 8 near Imtan, the crews being unhurt and in friendly hands. The third machine was reported down in the Jebel Druze district, but had not been found by the searchers up to February 8.

As reported last week, the three French airmen, Reginensi, Lenier and Touge, who were engaged on a flight from France to Madagascar, were forced down in the Hoggar district of the Sahara Desert on January 31. Although aeroplanes were sent out to search for the missing airmen, it was not until February 5 that they were located about 150 miles south of Insalak. It appears that, their water supply being exhausted, Reginensi set out on foot across the desert to find a well, and eventually found one. He returned to his companions, and it was while he was leading them back to it—altogether he had tramped 75 miles—that they were discovered by Col. Vuillemin and M. Poulain, who were looking for them from the air. Apart from being somewhat weak and exhausted the airmen were well.

Finally, Mlle. Maryse Hilz, who was also on a flight to Madagascar, was reported missing on February 4, eventually turned up at Niamey after a rough journey across the Sahara.

Vickers "Jockey"

In connection with the description of this machine, published in last week's issue of FLIGHT, we have been asked to point out that the performance figures quoted were *estimated* ones, based upon the results actually obtained with the machine as fitted with the Bristol VII F "Jupiter." These estimated figures related to the machine when fitted with the "Mercury" engine. Doubtless readers will have noticed that the photographs of the "Jockey" showed the Bristol VII F engine. While this explanation helps to account for the phenomenal performance, it does not quite explain how, with a wing loading of 22 lb./sq. ft., the landing speed is obtained. If our algebra is correct, a landing speed of 62.5 m.p.h. for a wing loading of 22 lb./sq. ft. would indicate a maximum lift coefficient of about 1.1 in British "absolute" units. On the other hand, if one assumes the more reasonable k_1 max. of 0.7 the landing speed for this wing loading

should work out at something like 79 m.p.h. We assume that the landing speed meant is of the sort achieved by Mr. Hawks during his visit last summer, when he certainly did manage to bring his machine in at this speed by full and judicious use of his engine.

Following Aircraft Practice

THE wonderful record which has just been set up on Pendine Sands by Mr. George Eyston in a tiny little M.G. Midget car brings out to the full the value which motor-car designers may obtain from experiments carried out on aircraft lines in the wind tunnel. The original Midget from which this one was developed was first made up as a model and subjected to a series of extensive tests in the tunnel before the correct streamlining was decided upon. On Monday, February 8, the speed attained by this 746 c.c. car was 118.38 m.p.h. for the mile and 118.36 for the kilometre, both of which are world's records, subject to official confirmation. Several firms well known in the aviation industry contributed to this phenomenal performance, amongst whom may be mentioned:—Hobson (fuel gauge), Wakefield's (Castrol oil), B.P. (petrol), Dunlop (tyres), Terry (springs), and K.L.G. (plugs).

Bert Hinkler Crossing the Atlantic Again

ON February 10 Sq. Ldr. Bert Hinkler sailed for New York in the *Mauvetania*. His future plans are a bit uncertain, but amongst other things we understand that he has arranged a lecture tour in the States. We wish him the best of luck in his ventures whatever they be and a speedy return to the Old Country.

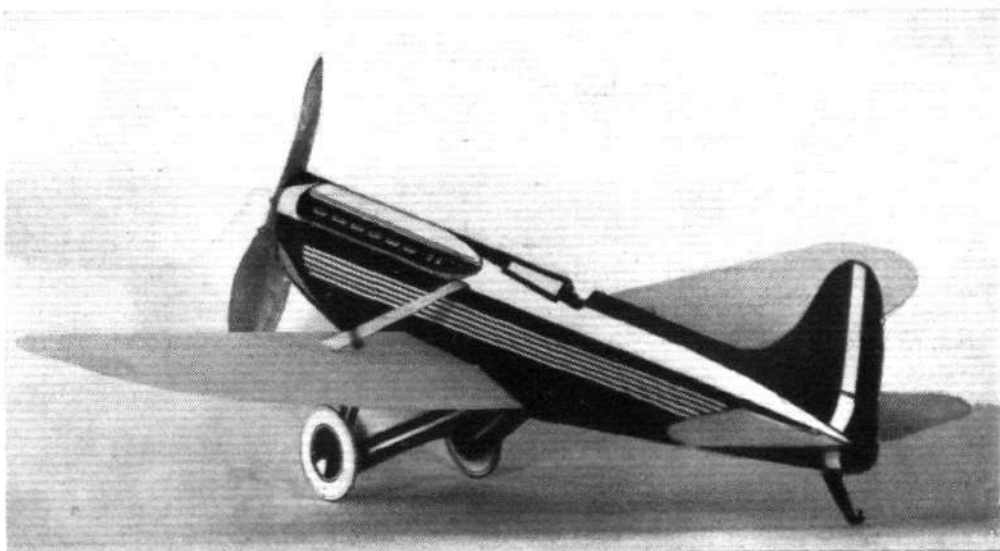
Foreign Visitors to Dublin

COL. V. SNELLMAN, second in command of the Finnish Air Service, accompanied by Mr. K. Berger, Chief Technical Officer of the same force, two representatives of Messrs. Vickers (Aviation), Ltd., and Col. Charles Russell, recently visited the headquarters of the Irish Free State Army Air Corps at Baldonnel Aerodrome, Co. Dublin, to witness a demonstration of Vickers "Vespa" army co-operation aircraft. Col. Snellman, with Mr. Berger as a passenger, flew one of the machines for some time, and on landing expressed himself very pleased with the manner in which it handled. A demonstration of aerobatics on a "Vespa" was given by Lt. Arthur Russell, who is recognised as the best "aerobatiser" in the Free State. This was followed by a formation flight by three machines of "B" flight, led by Capt. Hassett, and the accuracy with which stations were maintained, despite the low clouds and bumpy weather, was remarked by the onlookers. At the conclusion of the demonstration Mr. Berger spent some time in conversation with Mr. J. Doyle, Chief Aeronautical Engineer to the Free State Air Corps. The Minister of Defence, the Officer Commanding the Air Corps, Maj. Liston, and the officers were thanked by Col. Snellman for their kindness and hospitality.

Models

A PAPER MODEL THAT FLIES

AN indication of the remarkable progress made in the design and construction of model aeroplanes of to-day may, perhaps, be found in the paper model monoplane, shown in the accompanying illustration, which is presented with every copy of the current issue of the *Modern Boy*. As will be seen, this model—which follows the lines of the Supermarine Rolls-Royce S.6 Schneider Trophy winner—is faithfully like a full-sized aeroplane, an accomplishment rarely achieved with such models a few years back. Not only is it realistic in appearance, however, but it actually flies, and flies well—as we ourselves demonstrated—and on top of all, in construction it is merely cut out and simply folded together from the printed parts on a sheet (12 x 10 in.) of stiff paper! This cutting out, folding and glueing together is actually exceedingly simple, and when accomplished a metal bearing plate (formed like a radiator) carrying a metal airscrew, with a double strand of elastic (these will be presented with the following issue of the *Modern Boy*) is fitted on the nose of the fuselage, and the machine is ready to fly. After one or two simple adjustments this little model will accomplish a remarkably steady flight of two or more circuits when hand launched, and will also make a short flight r.o.g. from a smooth surface. These flights may be carried out in the

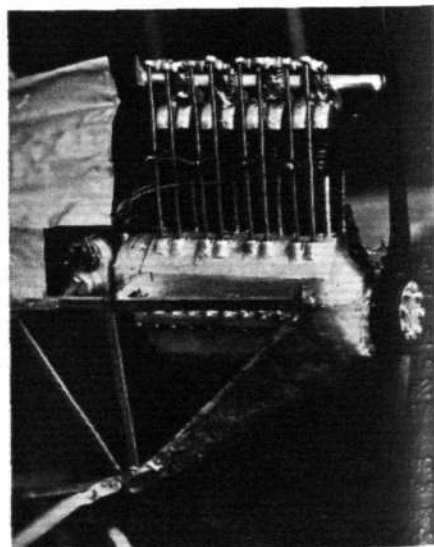


open air provided the wind is not too strong, but its performance in a large room or hall is truly remarkable. This will not be surprising to model enthusiasts when we say that the model in question has been designed by Mr. Rigby, who has specialised in these paper models for some time.

As we said at the outset, that such a successful model, both as regards general appearance and performance, can be obtained for the cost of two issues of the *Modern Boy* (i.e., 4d.) only shows how modern model aeronautics is progressing.

A WORKING SCALE MODEL

WE show in the accompanying illustration a "working" scale model of a de Havilland "Gipsy Moth" constructed (except for the engine) by Mr. Norman E. Neville, of Fareham. This model, which took just four



years to construct, is built to a scale of $1\frac{1}{2}$ in. to the foot, and is correct—to a really remarkable degree—in most of the important details. For instance, the fuselage, wings and tail units are built up with strips of wood strictly according to the original, all the controls work from both cockpits, and the undercarriage, of the latest "Moth" type, is sprung by springs encased and faired in approved style.

Other "true-to-scale" features comprise: (1) Tail-trimming gear working from the rear cockpit; (2) Handley Page slots; (3) sprung tail-skid working with the rudder;

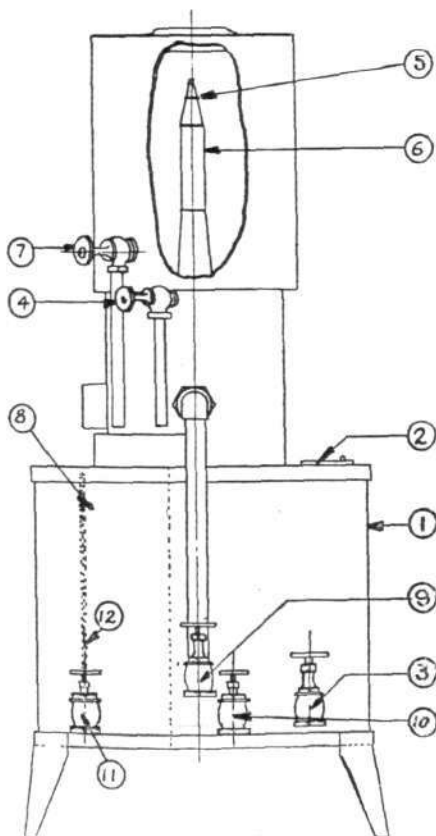
(4) folding wings with spring-loaded bolts. The "Gipsy" engine, also equally faithful to detail (even to the plugs and Zenith carburettor), was made by the Models Manufacturing Co., of Newington Causeway, S.E.1, and is driven by an electric motor, controlled by a switch on the fuselage. Only half the machine is covered (with real aeroplane fabric doped with Cellon aluminium dope), the other half being left uncovered to show the construction. All the wood for this model was supplied by A. E. Jones, Ltd., of New Oxford Street, W.C.1.

The Industry

OIL CLEANING

ADEQUATE LUBRICATION is one of the most important factors in the successful running, not only of aircraft engines, but also of all internal-combustion motors. One of the greatest troubles is that the lubricating oil when in use rapidly collects not only particles of metal from the engine, dust and dirt, but also becomes thickened and dirtied with both colloidal carbon and the products of such of its constituents as are subject to oxidation. Such dirty oil naturally has a greatly impaired lubricating value, hence the practice of draining out the engine and replacing with fresh oil at frequent intervals has grown up from a desire to run the engine under the best possible conditions. No doubt from the point of view of engine maintenance this is a distinct economy, but from the point of view of the oil itself it is not. Good lubricating oil is an expensive item, and the frequent replacement of even a few gallons soon runs away with a large amount of money. It is a well-known fact that high grade oils cannot be worn out, nor can their lubricating properties be destroyed, it is only the presence of metallic oxides, dust or grit held in suspension which render them unfit for further use. During the last few years many systems have been tried for the purification and cleaning of such oil so that a large proportion of it might be reclaimed, and one of the

best of these which we have lately inspected with interest is the Fox Patent Electric Oil Cleaner, marketed by British Oil Cleaners, Ltd., 66, Upper Richmond Road, Putney, S.W.15 (Putney 4627). This plant is entirely automatic in action and needs no supervision during the cleaning process. It consists of an upper and lower tank, the upper being used for cleaning and the lower for storage of both the dirty and clean oil. Water is put into the cleaning tank to the level of the water valve (4) and dirty oil is then poured in on top of the water to the level of the ring (5) situated near the top of the centre tube (6). In this centre tube is an electric heater, which by thermosyphonic action causes the water to circulate up the centre tube and emerge from the orifice at the top, where it spreads over the surface of the oil, falls down through it to the bottom, and carries with it the impurities. A powder supplied under the name of "Foxite," or in some cases for particular types of oil a special soap, is mixed with the washing water at the start, and this has the effect of assisting coagulation of any foreign particles in the oil, and also being of an alkaline nature removes any acids from the dirty oil. The heater is controlled by an automatic time switch, and after the allotted period the current is cut off, allowing the oil to cool down. This is then run off by the valve (7) into the storage tank (8), from which it may be drained off as required by the valve (11). The sludge and washing water is drained off by the main drain valve (9), after which the machine is ready for another complete cycle of operations. It will be seen, therefore, that such a plant is not only simple, but is also cheap to operate, and is obviously possible of effecting very great economies indeed in the lubricating oil bill. Many of the large road transport companies who already use outfits supplied by British Oil Cleaners affirm that cleaned oil has even better lubricating properties than fresh oil. By this we take it that they mean that the cleaned oil remains clean longer than does the fresh oil, for they explain this by the fact that when first used there is in the oil a certain percentage of the hydrocarbons which are oxidisable, and that these are gradually eliminated by each period of use, a process which they aver in no way impairs the oil. The use of such a cleaner, therefore, means that the operator is able to refill his crankcase or sump with oil, which has cost him very much less than fresh oil would have done. This is an obvious economy, and one of which further advantage could be taken by more frequent draining, so that at no time is the engine ever run with oil which is the slightest bit dirty. The process is not, we understand, quite perfected for use with pure castor oil, but several plants are already in use by aircraft operators whose especial needs are being studied most carefully by the company, who fully realise the necessity for cutting aircraft operating



The Fox Oil Cleaner.

- 1) Storage tank, (2) Dirty oil strainer,
- (3) Dirty oil draw-off valve, (4) Water level valve, (5) Oil level ring, (6) Centre tube,
- (7) Cleaned oil draw-off, (8) Clean oil storage,
- (9) Main drain valve, (10) Sludge drain for tank, (11) Clean oil draw-off, (12) Two-way valve.

costs to a minimum; a matter which will certainly be assisted by the reclamation of from 80-95 per cent. of the dirty lubricating oil.

AN AIRCRAFT COMPASS

A COMPASS, which is said to be exceptionally steady, has just been produced by Henry Browne & Son, Ltd., Barking, and is obtainable from Selfridge's Aviation Department. This is called the "Sestrel" A-trochilic aircraft compass. The Mark II version



The "Sestrel" Compass.

has a height of $3\frac{1}{2}$ in., with an overall diameter of $4\frac{1}{4}$ in. and weighs 44 oz. It is being marketed at a particularly keen price. The card consists of four black segments of a compass dial with a white line on each segment, lettered at E., S., and W., while the North point has a distinctive symbol. Two white grid wires are mounted on a course setting ring, which is divided into 360 deg. and graduated every 2 deg. This ring revolves on the top bezel and can be locked in the normal manner after setting. The card element consists of several small magnets having a very high directive force mounted under the segmented card, a method of construction which results in the definitely dead-beat propensities of the compass. The card element weighs under 3 grammes, and this extreme lightness, combined with the high directive force, keeps the card practically rigid however much the compass is swung about. The compass bowl is, of course, suspended in shock absorbing material to eliminate shocks due to landing, taxiing or engine vibration. Fixing is by the normal, three-slotted lugs, with an engraved vernier for ensuring a correct position of the lubber line.

FLOAT ON AIR CUSHIONS

DAVID MOSELEY & SONS, LTD., Ardwick, Manchester, make a range of "Float-on-air" upholstery very suitable for use in aircraft. The head-rests of all the Supermarine S.6B machines in the Schneider Trophy Contest were of this type, while the seat cushions would have been so had there been sufficient room for such comforts. Air-filled upholstery is very much more comfortable than the plain stuffed type and is particularly good for commercial work where passengers have to make long flights over a number of hours.

BRITISH INDUSTRIES FAIR

MANY FIRMS connected with the aviation industry will be exhibiting at the forthcoming British Industries Fair which is being held both in London (Olympia) and Birmingham from February 22 to March 23.

The Chloride Electrical Storage Co., Ltd., will, of course, have a complete range of their Exide batteries both high and low tension, as well as their Drydex dry batteries.

Darwins, Ltd., who are exhibiting at Birmingham, will be showing many different forms of their cast magnets as well as those made from rolled bar, thus providing a series from which magnets for every possible use can be chosen. Their Cobalt-Iron alloy is a magnetic alloy of high permeability having a saturation of from 10 to 15 per cent. higher than that of pure iron. Stainless steel is another of Darwins' products which is of interest to the aircraft manufacturer, particularly for fittings in flying-boats. Their non-distorting tool steels are of the type to attract the production and works managers, and one in particular, N. 1932, is remarkable. This is a chisel steel so strong that it maintains a keen cutting edge even when driven through a 2-in. steel bar.

Wild-Barfield Electric Furnaces, Ltd., will be showing on the stand of the Birmingham Corporation Electric Supply Department, and there it will be possible to see many of their fur-

naces actually working. Both the vertical and horizontal types of electro-magnetic hardening furnaces will be in operation as well as the new pit type with forced air circulation. Other exhibits will include a Vickers Pyramid Diamond hardness testing machine, the larger box-type heat-treatment furnaces, and the Wild-Barfield-Foster charge progress recorder, by which means the furnace operator is notified that the charge being tempered has reached the desired temperature.

Imperial Chemical Industries, Ltd., are showing a new material at both Birmingham and London. This is new plastic called Benzyl Cellulose. It has exceptional chemical stability, resisting alkalis and acids. It can be heated to 180 deg. C. without fear of decomposition, is non-inflammable, is resistant to water and its electrical properties are excellent. Such qualities, therefore, make this material suitable for an illimitable number of uses. Amongst those which most readily spring to mind may be mentioned: the basis of moulding material for any number of different trades; lacquers, dopes and enamels; safety glass fillings; artificial leather and a wide range of electrical uses. It may be produced in a variety of colours which do not change on prolonged exposure and there is no limit to the variety of effects obtainable. Also to be shown is the I.C.I. degreasing tank (marketed in the South and East by

James W. Carr & Co., Ltd.). This was fully described in *FLIGHT* for December 18, and does not need further explanation now. Its general use will undoubtedly make the work of all mechanics far more efficient.

Nobel Chemical Finishes, Ltd., will be showing their Deoxidine rust remover. This has the unique property of completely removing rust, leaving the surface of the metal so treated ready for painting. Another product of interest which this company is marketing together with the Fredk. Crane Chemical Co., is a finish called Dulux. This is made from synthetic gums and oils which can be chemically controlled, and therefore are of guaranteed uniform quality.

THE WILLIAMSON STAFF DANCE

THE STAFF of the Williamson Manufacturing Co., Ltd., held their first annual dinner and dance on Friday, January 29. The directors of the Company were the guests of the occasion, and a most enjoyable evening was spent at the Maison Lyons, in Piccadilly. A most excellent dinner was provided and this was followed by a dance at which about 80 members of the Company were present. The goodwill existing between the directors and their staff is a happy augury for the continued success of this firm, for it is only when employees are perfectly satisfied that the best workmanship can be expected.

Correspondence

The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.

THE POBJOY-KLEMM

[2788] My attention has been drawn to an article published in *FLIGHT* of the 29th ult. in which it is stated that Mr. A. B. Gibbons and Mr. B. R. Hannen have arrived at terms with Messrs. Leichtflugzeugbau Klemm whereby they are acquiring the licence to manufacture Klemm aircraft in England and to sell Klemms throughout the British Empire (excluding Canada). This is not the case.

I am instructed by my principals, Messrs. Leichtflugzeugbau Klemm, to categorically deny these statements and to inform you that they do not contemplate granting the licence to manufacture to these two gentlemen.

I would add that since I introduced the Klemm into this country, over three years ago, I am and always have been the British representative of the Leichtflugzeugbau Klemm and the sole concessionaire for Klemm aircraft.

E. F. STEPHEN.

Proprietor, S. T. Lea.

141, New Bond Street, London, W.1.

February 9, 1932.

[2789] With reference to the article which appeared in your issue of January 29, we would like to confirm that it correctly represented the position at that time.

The standpoint subsequently taken by certain interests is, in our opinion, a definite reversal of front, and in view of this we have no wish to continue negotiations, the foundations of which were laid at Boblingen.

It is a great pity that so useful a project should have been undermined by misunderstandings. In the circumstances it may be taken that we are no longer prepared to involve in negotiations of this kind the considerable British capital which we represent.

We sincerely thank you for the impetus which your

article gave to our enterprise. The Klemm-Pobjoy type has many virtues. Let us hope, therefore, that manufacturers in this country will be quick to appreciate these, and to obtain similar characteristics in an independent and All-British design.

A. B. GIBBONS.

B. R. HANNEN.

1, Shepherd's House, Shepherd Market,
London, W.1.

February 9, 1932.

THE ONE-DAY RECORD FOR COMMERCIAL MACHINES.

[2790] In your issue of February 5, page 118, we read with interest the claim made to a record for big commercial air liners for a single day's flight of 1,100 miles from Bushire to Karachi.

Our official records show that on the Amsterdam-Batavia weekly service the following single day's flights have been made:

9/4/31.—Bushire-Cairo, 1,299 miles.

8/5/31.—Rutbah-Athens, 1,353 miles.

4/5/31.—Allahabad-Jask, 1,519 miles.

Naturally we do not claim the best of these flights as a record, because it is always possible that some other company has a better day's mileage to its credit, and we have not had time to make that exhaustive inquiry into this matter, which we feel is necessary before a record can be definitely claimed.

We may say that all these flights were made in the normal course of operating this service, and that the machines used were standard K.L.M. air liners, as flown regularly on our European and Eastern routes.

H. SPRY LEVERTON
(Aerodrome Manager, K.L.M.).

Croydon Airport,
February 8, 1932.

THE ROYAL AIR FORCE

London Gazette, February 2, 1932.

General Duties Branch

The follg. are granted temp. commns. as Flying Officers on attachment to R.A.F. (January 17). *Sub-Lieuts.*, R.N.—J. Casson, D. H. Elles, V. C. Grenfell, A. A. Fitz-R. Talbot, R. C. Tillard. *Lieut.*, R.M.—W. H. N. Martin.

P/O. P. B. Coote is promoted to rank of F/O. (January 26).

The follg. are promoted with effect from February 1:—Flight Lieuts. to be Sqd. Ldrs.—F. L. B. Herbert, J. S. Chick, M.C., A.F.C., S. L. G. Pope, D.F.C., A.F.C., P. L. Plant, L. W. Jarvis, J. W. Baker, M.C., D.F.C., J. Potter, T. O. Clogstoun, J. H. Dand, M.B.E., G. Y. Tyrrell, M.C., A. F. Lang, M.B.E., B. K. D. Robertson, A.F.C., F. H. E. Reeve, R. M. C. Macfarlane, M.C., J. G. Walser, M.C., W. E. Swann, H. I. T. Beardsworth, A. P. Ritchie, A.F.C., G. E. Ranson, G. E. Wilson, G. T. Richardson, J. Duminy. F/O. to be Flt. Lts.—G. H. W. Selby-Lowndes, J. N. Jaques, H. P. F. Fagan, L. R. Stokes, W. G. Woolliams, M. M. Restell-Little, G. M. Buxton, J. R. Whitley, T. M. Abraham, R. J. Carvell, S. H. C. Gray, L. T. Carruthers, A. M. N. David, J. St. C. Arbuthnott, G. L. G. Richmond, A. Allen, H. G. Wheeler, W. J. H. Lindley, B. C. Yarde, C. E. Chilton.

Sqd.-Ldr. E. I. Russell is restored to full pay from half-pay (January 15); Sqd.-Ldr. D. Collyer, D.F.C., ceases to be seconded for duty with the Latvian Government (January 11); Lt. I. M. Martineau, R.N., F/O., R.A.F., ceases to be attached to R.A.F. on return to Naval duty (January 12); Flt.-Lt. H. Stafford is placed on retired list (January 29); Wing Com. R. B. Ward, A.F.C., is placed on retired list on account of ill-health (February 3); P/O. J. R. Paget resigns his short service commn. (February 3); the short service commn. of Pilot Officer on probation W. Dunne is terminated on cessation of duty (December 24, 1931); Lt. R. A. B. Michell, R.N., F/O., R.A.F., relinquishes his temp. commn. on return to Naval duty (January 8); Lt. (now Lt.-Com.) P. W. Wootton, R.N., F/O., R.A.F., relinquishes his temp. commn. on return to Naval duty (December 27, 1929) (substituted for *Gazettes*, January 17, 1930, and December 22, 1931).

Stores Branch

The follg. P/O. on probation are confirmed in rank and promoted to rank of F/O. (January 9):—H. A. Sudbury, J. R. Fraser.

The follg. are promoted with effect from February 1:—Flt. Lts. to be Sqd. Ldrs.—J. V. Mason, J. K. McDonald, W. A. O. Honey. F/O. to be Flt. Lts.—C. W. Gore, J. R. Brown, R. M. Thomas, E. A. Slater, C. P. Wingfield, B. E. Essex, L. Horwood, M.C., B. W. Hemsley.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodores: J. B. Bowen, O.B.E., to H.Q., Inland Area, Stanmore, for duty as Senior Air Staff Officer; 22.1.32. C. E. H. Rathborne, D.S.O., to H.Q., R.A.F. Mediterranean, Malta, pending taking over command; 22.1.32.

Group Captains: A. W. Tedder, to Air Armament School, Eastchurch, to command; 26.1.32. G. P. Grenfell, D.S.O., to No. 21 Group H.Q., West Drayton, pending taking over command; 25.1.32.

Wing Commanders: J. C. M. Lowe, to H.Q., Air Defence of Gt. Britain, Uxbridge, for Air Staff (Armament) Duties; 15.1.32. J. M. Robb, D.S.O., D.F.C., to R.A.F. Depot, Uxbridge, whilst attending course at R.N. Staff College, Greenwich; 12.1.32. G. R. M. Reid, D.S.O., M.C., F. G. D. Hards, D.S.C., D.F.C., M. Henderson, D.S.O., A. T. Williams, O.B.E., all to R.A.F. Depot, Uxbridge, whilst attending course Imperial Defence College; 19.1.32. J. A. G. De Courcy, M.C., to H.Q., Iraq Command, Hinaidi, for engineer staff duties; 23.1.32.

Squadron Leaders: B. J. Silly, M.C., D.F.C., to Superintendent of R.A.F. Reserve, Hendon; 15.1.32. R. A. George, M.C., to No. 33 Sqdn., Bicester; 18.1.32. H. K. Thorold, D.S.C., D.F.C., A.F.C., to R.A.F. Depot, Uxbridge, whilst attending course at Imperial Defence College; 19.1.32. L. M. Bailey, A.F.C., and W. A. Coryton, M.V.O., D.F.C., to R.A.F. Depot, Uxbridge, whilst attending course at Sen. Officers' School, Sheerness; 18.1.32. H. A. Whistler, D.S.O., D.F.C., P. E. Maitland, A.F.C., H. B. Russell, A.F.C., H. V. Rowley, D. V. Carnegie, A.F.C., all to R.A.F. Staff College, Andover; 18.1.32. A. G. Bishop, O.B.E., A.F.C., C. J. S. Dearlove, to R.A.F. Depot, Uxbridge, whilst attending course at Army Staff College, Camberley; 21.1.32. A. P. M. Sanders, to H.Q., Aden Command; 23.1.32. T. S. Ivens, to Air Armament School, Eastchurch; 25.1.32.

Permanent Commissions for Short-Service Officers

The names of the successful candidates who sat for the examination held in December, 1931, for specialisation with a view to being granted permanent commissions, are shown in order of merit below.

Twenty-eight officers reached the qualifying standard, those whose names are bracketed together obtaining equal marks. Vacancies will be allotted to the first 20 as indicated ("E" = engineering, "S" = signals, "A" = armament).

Flying Officers			
1. Downing, E. W.	"S"	11. Forbes, R. G.	"E"
2. Hartley, C. E.	"E"	12. Farnhill, G.	"E"
3. Paddon, B.	"E"	13. Louks, A. E.	"E"
4. Hodgson, T. W.	"S"	14. Fletcher, R. F.	"E"
5. Warrington, G. N.	"E"	15. Adnams, A. G.	"E"
6. Todd, R.	"E"	16. Houghton, A. H.	"E"
7. Cherrill, J.	"S"	17. Perkins, M. E. M.	"E"
8. Simpson, J. H. T.	"E"	18. Champion de Crespigny,	"A"
9. Jarman, L. E.	"E"	C.M.	"E"
10. Passmore, E. C.	"S"	19. Smythe, D. W.	"E"
		20. Stevens, A. M.	"E"

Royal Air Force: Vacancies for Apprentice Clerks

The Air Ministry announces:—Vacancies exist in the Royal Air Force for well-educated boys, between the ages of 15½ and 17, to enter as apprentice clerks in April and July next. The appointments will be made partly by the entry of boys who have obtained an approved school certificate.

Medical Branch

The follg. are granted short service commns. as F/O.s for three years on active list, with effect from and with seny. of December 1, 1931:—F. W. P. Dixon, M.B., B.S.; C. R. Palfreyman, M.B., B.S. The follg. are granted short service commns. as F/O.s for three years on active list, with effect from January 18, and with seny. of the dates stated:—J. A. Kersley, M.R.C.S., L.R.C.P. (July 18, 1931); D. C. MacGilchrist, M.B., Ch.B. (January 18, 1931); C. A. Rumball, M.R.C.S., L.R.C.P., L.D.S. (January 18, 1931); A. M. Westor, M.R.C.S., L.R.C.P. (April 18, 1931). Flt.-Lt. A. S. Burns, M.B., Ch.B., is granted a permanent commn. in this rank (February 3); Sqd.-Ldr. H. B. Troup, M.R.C.S., L.R.C.P., is placed on retired list on account of ill-health (February 3).

Chaplains Branch

The Rev. J. J. Case is granted an honorary commn. as a Chaplain with relative rank of Wing Commander (February 2).

ROYAL AIR FORCE RESERVE

RESERVE OF AIR FORCE OFFICERS

General Duties Branch

The follg. P/O.s are promoted to rank of F/O.:—C. W. J. Allen (December 2, 1931); C. J. Sanders (December 3, 1931); C. D. Pitman (December 16, 1931); J. A. Champness (December 19, 1931); A. I. A. McDougall (December 19, 1931); J. K. Lawrence (December 25, 1931); E. L. Briggs (December 25, 1931); G. D. M. Blackwood (December 26, 1931); J. C. Corby (December 30, 1931). Flt.-Lt. H. G. P. Rees relinquishes his commn. on completion of service and is permitted to retain his rank (October 24, 1931).

Stores Branch

Sqd.-Ldr. A. Burtenshaw, O.B.E., M.C., is transferred from Class C to Class B (June 24, 1931).

SPECIAL RESERVE

General Duties Branch

P/O. C. N. Shaw is granted honorary rank as F/O. (November 15, 1931) P/O. F. L. D. Salter is promoted to rank of F/O. (December 4, 1931); F/O. W. O. B. Knox resigns his commn. (January 3, 1931).

Flight Lieutenants: F. V. Beamish, to H.Q., Air Defence of Great Britain, Uxbridge; 16.1.32. C. Walker, to No. 207 Sqdn., Bircham Newton; 14.1.32. J. V. Kelly, to R.A.F. Depot, Uxbridge; 13.1.32. W. Elliot, D.F.C., H. T. Lydford, A.F.C., C. H. Stillwell, S. E. Storrar, H. S. Broughall, M.C., D.F.C., A. J. Rankin, A.F.C., J. A. Gray, D.F.C., R. Ivelaw-Chapman, D.F.C., A.F.C., R. L. M. Barbour, D.F.C., A.F.C., F. F. Garraway, W. F. Dry, L. Darvall, M.C., E. F. Haylock, J. L. Airey, D.F.C., H. G. Brookman, R. H. S. Spaight, all to R.A.F. Staff College, Andover; 18.1.32. G. Bowen, to No. 1 Stores Depot, Kidbrooke; 15.1.32. B. E. Embry, A.F.C., to No. 23 Group H.Q., Grantham; 1.1.32. J. S. Chick, M.C., A.F.C., to No. 203 Sqdn., Basrah, Iraq; 23.1.32. R. D. Starley, M.C., to Aircraft Depot, Hinaidi, Iraq; 23.1.32. J. C. Barraclough, to H.Q., Iraq Command, Hinaidi; 23.1.32. W. J. Millen, to H.Q., Iraq Command, Hinaidi; 23.1.32. J. Bradbury, to No. 30 Sqdn., Mosul, Iraq; 23.1.32. A. H. Love, to H.Q., Iraq Command, Hinaidi; 23.1.32. G. D. Harvey, to No. 70 Sqdn., Hinaidi, Iraq; 23.1.32. J. A. Tindall, to R.A.F. Depot, Aboukir, Egypt; 7.1.32.

Flying Officers: F. W. Murison, to No. 7 Sqdn., Worthy Down; 16.1.32. G. C. Holland, to No. 24 Sqdn., Northolt; 16.1.32. B. T. Crook, to H.Q., Air Defence of Gt. Britain, Uxbridge; 14.1.32. V. B. J. Jackson, to R.A.F. Base, Gosport; 23.1.32. G. H. A. Blackwood and I. L. S. McNicol, to No. 70 Sqdn., Hinaidi, Iraq; 23.1.32. W. K. Brett, to No. 1 Armoured Car Co., Hinaidi, Iraq; 23.1.32. A. E. Smith, to No. 55 Sqdn., Hinaidi, Iraq; 23.1.32. C. A. M. Kyrke-Smith, to No. 31 Sqdn., Quetta, India; 23.1.32. L. J. Crosbie and G. A. Bolland, to No. 84 Sqdn., Shaibah, Iraq; 23.1.32. R. G. Forbes and G. P. Charles, to R.A.F. Depot, Uxbridge; 24.12.31. J. A. Harris, to No. 500 Sqdn., Manston; 23.1.32. G. W. Phillips, to No. 12 Sqdn., Andover; 21.1.32.

Pilot Officers: G. D. Stephenson, to No. 1 Armoured Car Co., Hinaidi, Iraq; 23.1.32. K. Lea-Cox, to No. 30 Sqdn., Mosul, Iraq; 18.12.31. H. W. Marlow, to No. 55 Sqdn., Hinaidi, Iraq; 18.12.31.

and partly by means of open competitions which will be held by the Civil Service Commission in April at various centres.* Applications in respect of the April examinations should be made to the Civil Service Commission not later than February 18.

Detailed information regarding the apprentice clerk scheme can be obtained from the Secretary, Air Ministry (Apprentice Clerks' Department), Gwydyr House, Whitehall, S.W.1. Successful candidates will be required to complete in addition to the training period, 12 years' Regular Air Force service after reaching the age of 18. At the age of 30 they may return to civil life or may upon attaining Non-Commissioned Officer rank and subject to Service requirements, be permitted to re-engage to complete time for pension.

Boys entered under this scheme undergo a two years' course of training in clerical duties, typewriting, shorthand, bookkeeping and practical office routine, during which time their general education is continued under a staff of graduate teachers.

The apprentice clerks are at present paid 1s. a day for the first year and 1s. 6d. a day afterwards. The subsequent commencing rates of pay, at present varying from 3s. to 4s. 6d. a day (21s. to 31s. 6d. a week), depend upon the degree of success they achieve at their final examination. In addition, they receive free board and lodging and a uniform allowance.

* The Open Competition is conducted by the Civil Service Commissioners at the following centres:—

London.	Belfast.	Edinburgh.	Plymouth.
Birmingham.	Chatham.	Cardiff.	Portsmouth.

THE DISARMAMENT CONFERENCE

(Concluded from page 130)

accepting the prohibition of such use, agreed similarly to prohibit bacteria methods in warfare between themselves. I believe that at least 32 Governments have already ratified this Protocol, and I am glad to think that among them are the Governments of all the members of the British Commonwealth of Nations. Similar prohibition is contained in Article 39 of the Draft Convention for disarmament which we have before us. I feel convinced that the conscience of the civilised world will not be satisfied till similar effective prohibition has been imposed on all practices which shock our common humanity.

"The other weapon to which I shall specifically refer is the submarine. . . .

"Let me sum up, then, by indicating in simple and direct terms some of the directions in which the British delegation believe that the limitations and reduction of armaments may be practically applied. . . .

"We accept, as the basis of our future discussions, the general scheme of the Draft Disarmament Convention.

"We accept, in general, the method of limitation by reference to the establishment of maxima contained in that Convention.

"We support the establishment of a permanent Disarmament Commission.

"We urge the abolition of gas and chemical warfare.

"We press for the abolition of submarines.

"The abolition of conscription is, as we realise, a subject with controversial aspects, but we seek and urge upon this point the most practicable course for limiting by agreement the numbers of effectives.

"The temptation to resort to armed conflict is obviously reduced if defence is strengthened at the expense of attack, and since our common object is not to increase, but to diminish, the sum total of armaments and their expense, it follows that we must direct especial attention to such prohibitions or limitation as will weaken the attack, and so remove temptation for aggression.

"I have already made a reference to what has been accomplished between certain of the principal naval Powers in the direction of limitation of naval armaments, and

"We are ready to co-operate in whatever methods are found most practicable for agreed reduction in the size of ships and of maximum gun calibre, as well as in practical application to the principle of prohibiting land guns above a certain calibre."

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A Hint to Employers

THE Guild of Air Pilots and Air Navigators of the British Empire has an employment bureau, on whose books are registered the names of many "B" licence pilots and 2nd class navigators. Employers who want the services of further pilots than those already on their staff should therefore make use of this bureau, for at present no charge is made. The telephone number is Central 8668.

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PUBLICATIONS RECEIVED

Technical Notes of the U.S. National Advisory Committee for Aeronautics: No. 367, *The Aerodynamic Characteristics of Three Tapered Aerofoils Tested in the Variable Density Wind Tunnel.* By R. F. Anderson. February, 1931. No. 383, *Metal-Truss Wing Spars.* By A. E. Swickard. July, 1931. No. 384, *Effect of Injection-Valve Opening Pressure on Spray-Tip Penetration.* By A. M. Rothrock and E. T. Marsh. July, 1931. No. 385, *Tests of Six Symmetrical Aerofoils in the Variable Density Wind Tunnel.* By E. N. Jacobs. July, 1931. No. 386, *Effect of Nose Shape on the Characteristics of Symmetrical Aerofoils.* By R. M. Pinkerton. August, 1931. No. 387, *Pressure Distribution over a Modified Elliptical Wing Tip on a Biplane in Flight.* By R. V. Rhode and E. E. Lundquist. August, 1931. No. 388, *A Comparison of the Aerodynamic Characteristics of Three Normal and Three Reflexed Aerofoils in the Variable Density Wind Tunnel.* By G. L. Defoe. August, 1931. No. 389, *N.A.C.A. Apparatus for Studying the Formation and Combustion of Fuel Sprays and the Results from Preliminary Tests.* By A. M. Rothrock. September, 1931. No. 390, *A Method for Reducing the Temperature of Exhaust Manifolds.* By O. W. Schey and A. W. Young. September, 1931. No. 391, *Tests of N.A.C.A. Aerofoils in the Variable Density Wind Tunnel: Series 43 and 63.* By

E. N. Jacobs and M. Pinkerton. September, 1931. No. 392, *Tests of N.A.C.A. Aerofoils in the Variable Density Wind Tunnel: Series 45 and 65.* By E. N. Jacobs and R. M. Pinkerton. September, 1931. No. 393, *An Investigation of Cotton for Parachute Cloth.* By W. D. Appel and R. K. Worner. September, 1931. No. 394, *The Prevention of Ice Formation on Gasoline Tank Vents.* By T. Theodorsen and W. C. Clay. October, 1931. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

The Hawk. December, 1931. Royal Air Force Staff College, Andover.

Motor Boating. By Harvey Snoxell. London: Sir Isaac Pitman & Sons, Ltd. Price 2s. 6d. net.

Calendar, 1932. The Bristol Aeroplane Co., Ltd., Filton, Bristol. Christopher Strong. By Gilbert Frankau. London: Hutchinson & Co. Price 7s. 6d. net.

Royal Air Force Quarterly. Vol. 3, No. 1. January, 1932. Aldershot: Gale & Polden, Ltd. Price 5s. net.

Economic Conditions in Germany to September, 1931. Report by J. W. Thelwall and R. P. F. Edwards. No. 500. Department of Overseas Trade. London: H.M. Stationery Office, W.C.2. Price 4s. net.

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NEW COMPANY REGISTERED

POBJOY AIRMOTORS, LTD., Hooton, Wirral, Cheshire. Increases of capital. The nominal capital has been increased by the addition of £5,000 beyond the registered capital of £8,400. The additional capital is divided into 4,000 10 per cent. (non-redeemable) preference and 1,000 ordinary shares of £1 each, ranking pari passu with existing shares.

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AERONAUTICAL PATENT SPECIFICATIONS

(Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specification will be printed and abridged, etc.)

APPLIED FOR IN 1930

Published February 11, 1932

- 26,700. PRECISION MODERNE. Device for correcting anti-aircraft gun-sights. (365,083.)
30,586. P. SALMON and H. L. C. HARPER. Aircraft-launching apparatus. (365,065.)
38,440. STEEL WING CO., LTD., and D. H. FMBY. Sheet-metal spars. (365,280.)

APPLIED FOR IN 1931

Published February 11, 1932

357. A. E. SHORT and H. O. SHORT. Fairings for streamlining struts of aircraft. (365,300.)
4,825. SIR W. G. ARMSTRONG WHITWORTH AIRCRAFT, LTD., and J. LLOYD. Landing-gear for aircraft. (365,363.)
4,826. SIR W. G. ARMSTRONG, WHITWORTH AIRCRAFT, LTD., and C. V. MURRAY. Aircraft landing-gear. (365,364.)
9,767. L. CONSTANTIN. Devices for stabilising aeroplanes by means of wind vanes. (365,417.)
10,828. SEBIA SOC. D'EXPLOITATION DE BREVETS POUR L'INDUSTRIE, L'AVIATION, ET L'AUTOMOBILE. Four-stroke-cycle i.c. engines and supercharger. (365,431.)
14,041. H. JUNKERS. Brake-operating apparatus for aircraft. (365,455.)

SECRET PATENTS RE-ASSIGNED TO THE INVENTOR

APPLIED FOR IN 1925

Published February 11, 1932

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